NON-BIBLIOGRAPHIC DATABASES

Lucy Te-Chu Lee*

1. Introduction

The dial-up online information retrieval service has been with us for over ten years since the inauguration of the first dial-up online information retrieval service, the MEDLINE of the National Library of Medicine in 1971. Increasing numbers of libraries all over the world are finding vital information rapidly through online information retrieval services, and online services of all kinds play an increasing role in the large, modern library today.

Online information retrieval services have been commercially available since the early 1970s. Since that time, the online databases have grown in size, type, and number. It was estimated that by the end of 1980, the number of public available computer-readable databases would reach over 650 and would contain more than 75 million records. There are various online database system vendors in the USA, Canada, and Europe who also provide online database services. Major vendors include the National Library of Medicine (NLM), Lockheed Information System (LIS), System Development Corporation (SDC), Bibliographic Retrieval Service (BRS), the Canada Institute for Scientific Information (CISTI), and the European Space Agency (ESA).

In the beginning, these computer-readable databases were given a general name: bibliographic databases; but actually the majority of the computer-readable databases are non-bibliographic

* Lucy Te-chu Lee is Professor of the Dept. of Library Science, National Taiwan University.
in nature. Non-bibliographic databases (NBDBs) have existed among us for a long time, particular in the financial, economics, and technology areas. Because of their special characteristics, it is impossible to estimate the total number of them and locate them all.

Online output examples of bibliographic and non-bibliographic databases are shown in the Appendix.

In recent years, there were many promotional activities on NBDBs conducted in the United States, such as the founding of the ASIS Special Interest Group on Numeric Databases (SIG/NDB) in 1975; the chapter on “Numeric Databases and Systems” in the 1977 volume of the Annual Review of Information Science and Technology (ARIST) by Luedke et al.; Cuadra Associates’ seminar team on NBDBs in this country and in four European countries which began in 1978; the sessions on non-bibliographic online systems at the 1979 ASIS National Meeting; a symposium on problems and techniques in retrieval of numerical data at the 178th National Meeting of the American Chemical Society in 1979; and a list of non-bibliographic databases online also appears periodically in Online Review. All of these were aimed at creating awareness of the existence and the importance of NBDBs to the information community and to users as well.

2. Definitions and Classifications

A database is an organized collection of bibliographic or non-bibliographic information/data in machine-readable form accessible by computer. Databases vary in subject, type, scope, format, currency, and chronological coverage. Databases have been classified in various ways. Two major classifications are mentioned:

A. Bibliographic and Non-bibliographic Databases:
1. Bibliographic: This database refers or points to literature sources for information.

2. Non-bibliographic: This database contains facts and yields actual information which may be numeric, full-text, or directional in nature rather than bibliographic; and these databases stand alone as source information or raw data. Other names, such as "data files", "data bank", "information bank", "facts bank" are used to indicate this type of database. The term "data bank" is usually used in European countries.\(^{13}\)

B. Cuadra Associates' Classification Scheme: The recently adopted classification scheme for online databases by Cuadra Associates, Inc. (CA) used in its publication *Directory of Online Databases*.\(^{14}\) It is very similar to the above classification scheme in categorizing the databases, but further subdivides them into the following groups:

1. Reference Databases: These contain references or secondary information that refer the users to primary sources (e.g., articles, patents, organizations, or individuals) for more complete information. It further divides into the following:
   a. Bibliographic: This database contains bibliographic citations with/without abstracts of the printed materials.
   b. Referral: This database refers users to organizations, experts, directories, and audio visual materials for information.

2. Source Databases: These databases contain the primary, complete, full-text, or source information/data for the answers. Source databases are further divided into the following:
   a. Numeric: This database contains the numeric values of an original survey, or experimental data that has been analyzed, summarized, or statistically manipulated--typically the time series.
   b. Textual-numeric: This database contains records with a combination of textual information and numerical data.
   c. Properties: This database contains handbook or dictionary type of information/data, typically chemical and
physical properties.

d. Full-text: This database contains records of a complete text of an item, e.g., a newspaper article, a court decision, or a patent specification.\textsuperscript{15,16}

3. The Characteristics of Non-bibliographic Databases

The non-bibliographic database possesses a particular set of characteristics which are in marked contrast to the bibliographic databases. These characteristics, which have been identified by various authors, are synthesized as the following:

A. Access
B. Software
C. Use
D. Type of Information
E. Data Management
F. Production
G. Types of Systems\textsuperscript{17,18,19}

A. Access to NBDBs is frequently restricted and limited to a specific user community, or to closed user groups, or to users of particular countries, or to persons with a "need-to-know" status, or to users of specific retrieval services. The reason for limited accessibility is data security/confidentiality, because many NBDBs are created by government agencies and private organizations only for their internal use. Furthermore, many of the NBDBs are not even online at this time.

B. Software configurations in the NBDB service systems are often more sophisticated than in the bibliographic systems. They permit the users to do retrieval, analysis, statistical manipulation, modeling, forecasting, and report generation with the databases, and also they are capable of displaying graphic presentation in various formats.

C. Use of non-bibliographic online services is governed by
the system functions as determined by the sophisticated software packages. Due to system capability, the end-users are the primary users (e.g., economists, lawyers, chemists, doctors, etc.) rather than librarians and information specialists. This is especially true in most cases in using numeric databases. The efficient use of the system may well require a knowledge of system protocols, programming ability, statistical analysis procedures and techniques, and subject expertise. This compares to bibliographic services, in which 79 per cent of the use is by the intermediaries (e.g., librarians, information specialist).20 According to Houghton and Wisdom's survey on the use of NBDBs in economics, finance, and business, 80 per cent of the users were analysts, economists, and planners, and 19 per cent of users were library or information personnel.21 The NBDB users expressed their satisfaction with these databases, and said that they are versatile, convenient, time-saving, and easier to use than the bibliographic ones. They liked best of all, the unique feature of NBDB services in retrieving the "actual information" rather than references or citations to the information.22, 23

D. Type of Information: Information/data are derived from the areas of business, economics, social science, science and technology. The majority of NBDBs are in the business area with numeric information in their content. The primary types of NBDBs contain social science survey data, statistics, demographic data, corporate financial information, stock market quotations, securities, current exchange rates, chemical and physical properties, chemical nomenclature and structure, technology transfer information, grants/contracts/sources/awards, directory/handbook/dictionary/catalog type information, thesaurus, authority lists, news articles, charts and maps, laws and regulatory decisions.24, 25

E. Database Management in NBDB services is more complex. Data are variable in character and can be represented and measured in many ways. The record structures are many and variable, unlike the record formats in bibliographic databases, which are basically uniform and have greater structural clarity.
Some systems are required to store various conditions of search parameters for manipulation purposes. Update frequencies in some of the NBDBs are vitally important, especially in some of the business and legislative databases. Dow Jones News/Retrieval Service and Stock Quote Reporter (DJNR) claims to update its database information in seconds.\textsuperscript{26}

F. Production of NBDBs is said to be more costly than the production of the bibliographic databases.\textsuperscript{27} Further investigation and studies are needed in this area. At the present time, NBDBs are provided by a far greater number of vendors. Because of minimal advertising and poor marketing, it is difficult to become aware of their existence. Most of the vendors are marketing their database services directly to the end-users. The United States produces more NBDBs than the European countries. Also, government agencies produce more NBDBs than bibliographic databases. Numeric databases constitute some 75 per cent of all NBDBs. Luedke estimates that there are more than ten thousand numerical databases in existence, although most of these are private and out of the public domain. Currently there are over 150 publicly available non-bibliographic database.\textsuperscript{28, 29}

G. Types of Systems: Systems that support use of the majority of NBDBs are of four kinds, according to Wanger and Landau:\textsuperscript{30}

1. Generalized Systems: The generalized information retrieval systems are found in major bibliographic systems that usually provide access to a wide range of bibliographic and referral databases, such as DIALOG, BRS/STAIRS, and ORBIT systems. The design criteria for generalized systems are focused on "user-orientation", powerful functions, cost-effectiveness, and flexible command-structure interfaces, so that the users may very easily use various commands to conduct searches. In addition, many of the time-sharing firms offer online services through a database management system(DBMS) which has generalized capabilities for handling even numeric databases. At the present time, DIALOG has over 40 NBDBs in its system.
2. *Tailored Systems:* The design of this system type has been tailored to provide particular capabilities or to solve specific problems. These systems tend to be "prompt-oriented" in their interface languages. The system is less flexible but as powerful as a generalized system, e.g., the Business International Corporation's BI/DATA database.

3. *Retrieval and Display Systems:* These systems are designed to provide straightforward retrieval and display functions only, such as the Toxicology Data Bank (TDB) of the NLM, and the Computerized Resources Information Bank (CRIB). Both are bibliographic-like systems which can handle easily the textual/numerical type of databases.

4. *Modeling and Analysis Systems:* The idea of "doing something with the data" is the heart for designing these sophisticated systems, which combine modeling and simulation capabilities with significant databases components and value-added facilities. These enable the users to do complicated searches, analysis, and statistical manipulations with the database. For example, the ManLab-NPL Materials Data Bank, and SANSS (Structure and Nomenclature Search System) of the NIH/EPA Chemical Information System(CIS). Because of the complexity of the analysis techniques of the searching procedures involved, it is believed that knowledge of the subject and the system operations is imperative. With SANSS, a subsystem of CIS, which contains 200,000 chemical compounds, the users can draw the structure of a molecule and have the system search for molecules of the same or similar structure, or retrieve nomenclature and structural information for all related substances.\(^{31,32}\)

4. **Problems in Non-bibliographic Databases**

There are no "supermarket" NBDB systems. Also, there are certain problems in these systems relating to standardization, quality of data, data evaluation, government NBDBs, and costs.
A. No "supermarket" systems: There are no systems such as Lockheed, SDC, and BRS, which offer access to several databases in a wide variety of subjects for NBDB services, but there are many "specialty vendors" or "specialty online database suppliers" who provide access to only one or a few databases or groups of databases of particular types or in certain subject areas for specific target customers, e.g., Data Resources, Inc., (DRI) the world's most successful online database company, handles one type of NBDB—numeric databases—exclusively. Users may need to subscribe to several online services in order to meet their needs, and the searchers must learn the functions of each system in order to use them all. With constant changes in the systems, it is very inconvenient, time consuming, costly, and frustrating. Another problem is that since information concerning NBDB systems and services usually appears in various sources rather than professional journals, it is very difficult to learn of the existence of such services and to locate them.

B. Standardization is a major problem in both bibliographic and non-bibliographic services. A user must learn the language and protocols peculiar to each eservice. In dealing with NBDBs, the more complex file structure and variety of each formats exacerbate this problem. In addition, the use of terminology, definitions, measurement units, codes, indexing techniques and search languages of various databases is not uniform. Incompatibility among databases and systems is a major obstacle to data exchange and inter-system communication. Development of a standardized format for machine-readable bibliographic and non-bibliographic databases is needed. At the present time, the U.S. Energy Research and Development Administration (ERDA) interlaboratory Working Group for Data Exchange is designing the format based on the American National Standard for Bibliographic Information Interchange on Magnetic Tape, ANSI Z39.2—1971 Standard and the International Standard Documentation Format for Bibliographic Information Interchange on Magnetic Tape (ISO 2709—1973).
C. Data evaluation and quality control: The accuracy and reliability of data in NBDBs are of great importance. In NBDBs, data evaluation is currently applied mostly to certain kinds of scientific and technical numeric data. Quality control of social and economic data is difficult, because many variable parameters are used with the data, and it is very complicated to evaluate the data accurately.\textsuperscript{36} Data evaluation requires subject knowledge, and is very time consuming and very expensive. What is the trade-off between the dissemination of un-evaluated current data and not so timely evaluated data? Research is needed here. As for quality control of the data, Nancy Norton once said that a lack of quality control could diminish the magic of online information service; search funds are wasted, end-users are disappointed, and intermediaries are embarrassed.\textsuperscript{37} In NBDBs, some of the economic and financial databases with incorrect data and information errors are used for decision making which could cause a tremendous financial disaster!

D. Government NBDBs: In the USA there are government agencies which provide databases relevant to their own operation for public online searching. In Canada, Statistics, through its CANSIM facilities, provides centralized online access to statistical data produced by Canadian federal agencies. And there are no comparable government databases available for public use in Europe.\textsuperscript{38}

E. Costs: For most NBDBs an annual fee, or signing-on charge plus reduced annual subscription, are the normal means of handling costs. The charges will be higher or lower within the rates range of individual database depending upon the service package and combination of databases selected. In general, the NBDBs are more expensive to subscribe to, to use, and to produce in comparison with bibliographic databases.\textsuperscript{39}

5. National and International Data Activities
The formation of NBDBs began with numeric databases. As previously mentioned in this paper, 75 per cent of NBDBs are numeric. Thousands of numerical databases are being compiled daily and stored in various places, but only a small fraction can be found easily. The need for better organization, accessibility, and utilization of all types of NBDBs has been recognized especially by national government agencies and various organizations. Both national and international data activities and centers have been established to deal with these matters. It has been estimated there are more than 5,000 national data centers in all fields of knowledge existing around the world.\textsuperscript{40} One should be aware of the major ones:

A. CODATA (The Committee on Data for Science and Technology) was established by the International Council of Scientific Union (ICSU) in 1966. The objective of CODATA is the improvement of all aspects of scientific and technical data compilation and dissemination on a world-wide basis. Subjects covered today by CODATA are physical, chemical, technological, biological, and geological data.\textsuperscript{41}

B. NDAB (The Numerical Data Advisory Board) of the U.S. National Academy of Sciences-National Research Council was created in 1963. It was stated that the function of NDAB is to assess adequacy of, and stimulate improvement of the quality, reliability, availability, accessibility, dissemination, utilization, and management of numerical data. Subject coverage includes numerical data of the physical, chemical, biological, and geological sciences, and engineering and technology.\textsuperscript{42}

C. NSRDS (National Standard Reference Data System) was established in 1963. It is operated by the Office of Standard Reference Data (OSRD) of the U.S. National Bureau of Standards. NSRDS is one of the largest data evaluation networks in the world. It consists of 15 decentralized data centers. Their program includes numerous data evaluation projects. These centers generate and disseminate critically evaluated scientific and technical data.\textsuperscript{43}
Other important data centers are: ICSU's WDCs (World Data Centers), CINDAS (Center for Information and Numerical Data Analysis and Synthesis of Purdue University), IASSIST (The International Association for Social Science, Information Service and Technology), etc.

6. Role of the Library, Information Center, and School of Library and Information Science

Regardless of the trend toward a predicted "paperless" or "less paper" society, there is no doubt that more NBDBs will be produced and used in the future. At the present time, the growth of numeric and modeling databases and systems is impressive. This is especially true for business-oriented and full-text data-bases which were high on the agenda of the National Online Meeting this year in New York City. Text line, a new "international" online business information service, covers foreign language materials. Full texts of the Harvard Business Review is available online now. In addition, the integration of online numeric data handling and manipulation capabilities with online text (e.g., Bibliographic reference) retrieval systems is of increasing interest to users, vendors, and system designers. It will link the bibliographic data to the non-bibliographic data.

What is the role of librarians, information centers, and schools of library and information science in relation to NBDB services? It was suggested by authors from the information profession that both the library and the information center should become more interested in NBDB online services and explore their contextual relevance to both worlds. Some libraries and information centers, indeed, are already examining and using NBDB services. At the same time, librarians and information specialists should prepare themselves for the tasks of furnishing this type of service by studying the characteristics of NBDBs and learning the searching skill. Now, there is urgent need for schools of library and infor-
Non-Bibliographic Databases

information science to provide online teaching packages to include NBDB retrieval. There is a need for trained "data librarians" now and there will be greater demand in the future.46,47

7. Conclusion

With the rapid development of online access to NBDBs, the future of libraries and information centers as providers of electronic information services of all kinds probably depends more on NBDB services than it does on bibliographic ones, because it is predicted that "Everything You Always Wanted to Know May Soon be Online."48 The economics of the online business indicates that about 80 per cent of revenues accrue from non-bibliographic services, with the remainder coming from bibliographic services.49 So "the librarian and information workers should wake up to the implications of the databank phenomenon or surrender to traditional reference function to service suppliers and information brokers."50 And also Blaise Cronin said:

"... most databank users were specialists/professionals, but that does not mean that the information worker has no part to play. It is up to the profession to decide that it should become involved in the databank revolution and then to establish areas in which its particular expertise and experience can most profitably be developed..."51

In conclusion, the future is in our hands. Shall we do something about it?
References


18. Cronin, op. cit., p. 244.
20. Ibid., p. 163.
23. Cronin, op. cit., p. 244.
34. Spreading the World on . . . , op. cit., p. 30.
41. G. C. Carter, “Numerical Data Retrieval in the U.S. and Abroad,”


49. Hoover, op. cit., p. 251.


51. Cronin, op. cit., p. 249.
**Appendix: Online Output Examples of Bibliographic and Non-bibliographic Databases:**

**Bibliographic Databases:**

1. SDC ORBIT system: ERIC Database

| SS 5 /C7 | USER: cultural and pluralism |
| SS 5 PSTG (10) | |
| SS 6 /C7 | USER:prt fu indented |

---

| -1- | ACCESSION NUMBER |
| - | CLEARINGHOUSE ACCESSION |
| - | TITLE |
| - | AUTHORS |
| - | SOURCE |
| - | ISSUE |
| - | DOCUMENT TYPE |
| - | LANGUAGE |
| - | INDEX TERMS |
| - | ABSTRACT |

| EJ226749 | Ideological Eclecticism and Coherence among Black Soldiers: A Research Note. |
| UDS07914 | Weisberg, Kathleen Maas |
| CJN0V80 | O801 143 |
| - | English |
| - | %Activism; %Black Attitudes; Black Power; %Cultural Pluralism; %Goal Orientation; %Political Attitudes |
| - | Data from a sample of Black soldiers are utilized to examine extent to which 'eclecticism' (low interrelatedness between goal and means) rather than 'coherence' (high interrelatedness between goal and means) characterizes the ideological profiles of members of this minority group. (EC) |
SS 7 /C?
JGER:
prt is S fu

PROG:

-1-
AN — ED187815
CHAN — CE025595
OS — Kern County Superintendent of Schools, Bakersfield, Calif.
SP.O — Office of Education (DOHEW), Washington, D.C.
SD — See 1977; 37pp
LD — U.S.: California
IS — 8IE81134
AV — EDRS Price — MF01/PC02 Plus Postage. (1 MF).
NO — For related documents see CE 025 584-585, CE 025 587, CE 025 589-586, CE 025 589-600, CE 025 603, CE 025 605, CE 025 607, and CE 025 809.
DT — 082
LA — English
IT — #Allied Health Occupations; #Career Awareness; Career Development; #Career Education; Educational Resources; Grade 5; Grade 6; #Hospital Personnel; Instructional Materials; Intermediate Grades; Learning Activities; Lesson Plans; Occupational Clusters; Occupations; Units of Study
ST — Project CHOICE
AB. — This teaching unit, Hospitals, is one in a series of curriculum guides developed by Project CHOICE (Children Have Options in Career Education) to provide the classroom teacher with a source of career-related activities linking 5th and 6th grade elementary classroom experiences with the world of work. These eight lessons on hospitals cover the departments and jobs found in a typical hospital and describe training and school skills necessary for various hospital related professions. An introductory section gives the rationale for the unit, goals, performance objectives, entry-level assessment, and evaluation. A list of suggested instructional materials, such as films, filmstrips, books, community resources, and art supplies, is included in this section. Each lesson contains a statement of purpose, materials needed for the lesson, an introductory statement, class activities, and a summary activity. Written materials (such as worksheets, surveys, and task cards) are included where feasible. (MEK)

SS 7 /C?
JGER: e research a#d development centers

ROG:
S 7 PSTD (6)
S 8 /C?
JER:
"For"
2. DIALOG: System: Arbibliographes Modern Database

? S stock options
1  4 STOCK OPTIONS
? t 1/5/1
1/5/1
80007206  ID No: 80007206
The Options Market
Metzner, Irwin H.; Diliberti, Barbara A.
Executive v6ni 37-40 Fall 1979 Jrn1 Code: EXT
Doc Type: JOURNAL PAPER
The remarkable growth of the stock options market is largely due to its
versatility and flexibility. A call option is an option to purchase 100
shares of specific actively traded stock at a certain price any time during
the life of a contract. The action revolves around the price movement of
the underlying stock and its effect on the call's premium. The decision to
be a buyer or seller reflects the investor's analysis of the market, the
underlying stock, and his own financial objectives. Covered call writing is
a popular option strategy, as it can be tailored to suit and offers the
potential for a higher investment return; selectively and timing are the
keys to success. Naked or uncovered call writing, a very aggressive option
strategy, can offer very attractive leverage, but potential profit is
limited, while potential loss is not. During a call may serve numerous
investment objectives and offers excellent leverage and limited risk, but
the buyer must be prepared to lose 100% of his investments. Put options,
the mirror images of calls, allow investors to speculate on a stock decline
and to accomplish conservative, long-term aims.
Descriptors: Stock options; Options markets; Options trading; Put & call
options; Investment; Speculation; Strategy
Non-Bibliographic Databases:
1. PTS/U.S.: Forecasts

? S POPULATION
10  387 POPULATION
? S YR=1999
11  80 YR=1999
? C 10*11
12  1 10*11
? t 12/5/1
12/5/1
40272 Auto News 80/05/15 P32 United States
Driving age popnulation,
YEAR  GROWTH/yr
1990  
99  
GROWTH RATE= -.7%
SNGLNG (A GRP)
CC=USA  PC=E12194
2. BI/Data Time Series

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>1,065,000</td>
<td>1970</td>
<td>1,004,322</td>
<td>1979</td>
<td>940,607</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>872,054</td>
<td>1977</td>
<td>769,720</td>
<td>1976</td>
<td>701,117</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1975</td>
<td>616,869</td>
<td>1974</td>
<td>568,654</td>
<td>1973</td>
<td>582,091</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1966</td>
<td>276,179</td>
<td>1965</td>
<td>252,397</td>
<td>1964</td>
<td>228,449</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1963</td>
<td>203,068</td>
<td>1962</td>
<td>185,648</td>
<td>1961</td>
<td>172,001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1960</td>
<td>155,501</td>
<td>1958</td>
<td>141,245</td>
<td>1957</td>
<td>125,672</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SOURCE: BUSINESS INTERNATIONAL CORP. DIALOG FILE 128

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>1,756,000</td>
<td>1970</td>
<td>1,442,070</td>
<td>1979</td>
<td>1,164,670</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>970,269</td>
<td>1977</td>
<td>816,943</td>
<td>1976</td>
<td>701,117</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1972</td>
<td>314,301</td>
<td>1971</td>
<td>262,247</td>
<td>1970</td>
<td>225,695</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1966</td>
<td>125,672</td>
<td>1965</td>
<td>112,224</td>
<td>1964</td>
<td>101,649</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1963</td>
<td>86,856</td>
<td>1962</td>
<td>76,744</td>
<td>1961</td>
<td>70,363</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1960</td>
<td>52,814</td>
<td>1958</td>
<td>42,430</td>
<td>1957</td>
<td>37,241</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SOURCE: BUSINESS INTERNATIONAL CORP. DIALOG FILE 128
3. NII-EPA Chemical Information System

A very simple way to find a chemical substance in the CIS is with the nomenclature search option of the Structure and Nomenclature Search System (SANSS). This option, NPROBE, takes either a complete name or some fragment of a name of a substance and finds all occurrences of the name in the database. Upon request, these can be printed, using the option SSHOW. The SSHOW option will provide, amongst other things, the CAS Registry number of the compound, the key to other CIS components. The Registry number can then in turn be used to find the compound wherever it is cited in the CIS, permitting retrieval, for example, of its mass spectrum or its carbon-13 nmr spectrum, or its toxicity data.

OPTION? NPROBE
FRAGMENT OR WHOLE NAME SEARCH (F/W) (F)? M
SPECIFY FRAGMENT (C/R TO EXIT): BHT
FILE 1
1 COMPOUNDS HAVING FRAGMENT: BHT
SPECIFY FRAGMENT (C/R TO EXIT):

OPTION? SSHOW 1

STRUCTURE 1 CAS REGISTRY NUMBER 128-37-0
CIS Sources Of Information
2 - CIS, EI Mass Spectrometry
3 - CIS, Carbon 13 NMR Spectrometry: 128-37-0.01
6 - Cambridge Xray Crystal: 128-37-0.01
32 - NIOSH/CIS, RTECS: G07675000
71 - JCPDS/CIS, Powder Diffraction Patterns: 20133, 241580
115 - EPA/CIS, WaterDROP
124 - CIS, CI Mass Spectrometry
18 Non-CIS References Available

C

C

C

C

C

Phenol, 2,6-bis(1,1-dimethyl-ethyl)-4-methyl- (9CI)
Cresol, 2,6-di-tert-butyl- (8CI)
a-di-tert-Butyl-p-methylphenol
Avastab 401
Antioxidant DBPC
69 more names available

OPTION?