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Science and Engineering Information Resources  
Marine Instrumentation '90 Tutorial

Peter Brueggeman  
Head of Public Services  
UCSD Scripps Institution of Oceanography Library

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A vast amount of scientific and technical information is available both in print and online. Access to that information is essential for informed decision making and competitive proposals. Access encompasses determining what information is available and obtaining it. Structured around these two central concerns, topics covered by this tutorial will include printed information resources, online databanks searched by science libraries and those priced for personal use, specific science and engineering online and compact disk databases, access to commercial databanks and university library catalogs, information brokerage services, and document delivery services. This tutorial will review what you need to know to search and obtain scientific and technical information independently, through your academic or corporate librarian, or a combination of both.

Overview of Tutorial:

- \* GUIDES TO THE SCIENTIFIC & TECHNICAL LITERATURE
- \* ONLINE LIBRARY CATALOGS
- \* LIST OF INTERNET-ACCESSIBLE LIBRARY CATALOGS
- \* DIALING INTO THE UNIVERSITY OF CALIFORNIA LIBRARY CATALOG
- \* SEARCHING THE UNIVERSITY OF CALIFORNIA LIBRARY CATALOG
- \* PRINTED INDEXES AND ABSTRACTING JOURNALS
- \* PRINTED CURRENT AWARENESS SERVICES
- \* DATABASES

- \* TECHNICAL REPORTS & NTIS
- \* ONLINE CURRENT AWARENESS SERVICES
- \* DATABASE SEARCHING
- \* COMPACT DISK DATABASES
- \* COMPACT DISK PLAYERS
- \* ACCESSING COMPACT DISKS ON A NETWORK
- \* THOMAS REGISTER & YELLOW PAGES
- \* TRANSLATIONS
- \* FORTHCOMING MEETINGS
- \* PATENTS
- \* STANDARDS & SPECIFICATIONS
- \* TRADEMARKS
- \* INFORMATION BROKERS & DOCUMENT DELIVERY
- \* BIBLIOGRAPHIC DATABASE SOFTWARE
- \* SOURCE LIST OF PRODUCTS AND SERVICES

Addresses for services and products mentioned throughout the tutorial are listed at the end.

#### GUIDES TO THE SCIENTIFIC LITERATURE

Guides to the scientific literature are useful for familiarization with scientific and technical information resources. Guides typically analyze the structure and availability of scientific and technical literature and guide the user to the most important resources. Given the vast amount of published material in science and technology and since no one is readily familiar with that range of information, guides to the literature save time by pointing the user in the right direction in the search for information. Guides to the literature are usually shelved in

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a library's reference collection and are worthy of purchase for your personal library.

Currently the best guides to the scientific and technical literature are

SCIENTIFIC AND TECHNICAL INFORMATION SOURCES by Ching-Chih Chen (Cambridge, Mass : MIT Press, 1987).

WHAT EVERY ENGINEER SHOULD KNOW ABOUT ENGINEERING INFORMATION RESOURCES by Margaret Schenk and James Webster (New York : M Dekker, 1984).

Other useful but dated guides (watch for new editions)

GUIDE TO BASIC INFORMATION SOURCES IN ENGINEERING by Ellis Mount (New York : Wiley, 1976)

SCIENCE AND ENGINEERING LITERATURE: A GUIDE TO REFERENCE SOURCES by H Robert Malinowsky and Jeanne M Richardson (Littleton, Colo : Libraries Unlimited, 1980).

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#### RESOURCES COVERED BY GUIDES TO THE SCIENTIFIC LITERATURE

- OTHER GUIDES TO THE LITERATURE (discipline-specific guides may be available)
- SCIENTIFIC ENCYCLOPEDIAS.
- SCIENTIFIC DICTIONARIES. Using a guide to the literature, you can review the range of scientific dictionaries published. To purchase one personally, you should check BOOKS IN PRINT (ask at library or bookstore) in order to determine which scientific dictionaries are still in-print and available.

You can always check the SUBJECT GUIDE TO BOOKS IN PRINT (ask at library or bookstore) to determine what scientific dictionaries are available. However a guide to the literature will usually make evaluative comments about scientific dictionaries while BOOKS IN PRINT merely states the cost and publisher.

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- MULTILINGUAL SCIENTIFIC DICTIONARIES. A wide range of multilingual scientific dictionaries is available. For example, using a guide to the literature, you can determine if there is a German-to-English electronics dictionary available, and, if a polyglot electronic dictionary is available. Polyglot dictionaries will cover three or more languages and may be more versatile for personal needs.

A major supplier of multilingual scientific dictionaries is Associated Technical Services. In addition to dictionaries published in the US, ATS specializes in importing multilingual dictionaries published overseas. Imported multilingual dictionaries particularly Russian ones usually cost much less than those published in the US. Sometimes you can find the exact same dictionary as a US edition available for much less when published overseas.

- HANDBOOKS, TABLES, DATABOOKS. Guides to the literature are useful shopping lists for reviewing what is available.
- DIRECTORIES. Useful lists of names, addresses, phone numbers, and/or companies and products are hard to locate and one is never enough. In order to determine directories of interest, guides to the literature are helpful.

Especially helpful for determining availability of interesting directories is DIRECTORIES IN PRINT (Detroit, Mich : Gale Research). DIRECTORIES IN PRINT lists professional, scientific, business, and industrial directories.

A wide range of directories are published. Gale Research (Detroit, Mich) is a major publisher. ENCYCLOPEDIA OF ASSOCIATIONS covers state, regional, national, and international associations. University and non-profit research organizations are listed in RESEARCH CENTERS DIRECTORY. Governmental research organizations are listed in GOVERNMENT RESEARCH DIRECTORY and STATE GOVERNMENT RESEARCH DIRECTORY. Non-US research organizations are listed in INTERNATIONAL RESEARCH CENTERS DIRECTORY and EUROPEAN RESEARCH CENTRES. RESEARCH SERVICES DIRECTORY lists for-profit research organizations and independent consultants.

- INDEXES, ABSTRACTING JOURNALS, CURRENT-AWARENESS SERVICES. Guides to the scientific literature review the major resources for keeping up with the primary literature.

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- MAJOR BIBLIOGRAPHIES already compiled on scientific and technical subjects. These bibliographies are useful when you need a comprehensive review of the scientific literature on an unfamiliar topic. If a bibliography has been published, then you do not have to start from scratch and dig through indexes and abstracting journals. You only have to update from the date that the bibliography stops.

In looking for bibliographies, be sure to check a library catalog for a large library system (eg the University of California MELVYL online catalog). The larger the catalog, the greater the likelihood of finding a good bibliography. Since "bibliography" is a subheading used in library catalogs, you simply have to search for the main subject heading encapsulating your interest and add the subheading "bibliography."

- STANDARDS, PATENTS. Guides to the scientific and technical literature review resources to assist in searching for patents and standards.
- DATABASES. Most indexes and abstracting journals originate from a mother database which is also available for open access on commercial databanks. Guides to the scientific and technical literature review the range of databases available.

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#### ONLINE LIBRARY CATALOGS

Online library catalogs for academic libraries list their book holdings and are increasingly becoming available for open access on the Internet. Most academic library catalogs can be accessed by on-campus users or those with accounts on campus computers. In addition free access through the Internet may be available to all those whose computers are on the Internet. The Internet interconnects over 1000 independent networks including BitNet, CSNet, ARPANET, NSFnet, and NASA Science Network. These networks run the TCP/IP protocol suite to interconnect via gateways. Governmental, educational, and corporate host computers are on the Internet.

If your institution's computer is on the INTERNET, then you can access academic library catalogs directly. The TELNET

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command is used in conjunction with an Internet address for the computer hosting the library catalog.

For example, to access the University of California's MELVYL online catalog, log onto an Internet computer and type

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TELNET 31.0.0.11
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31.0.0.11 is the IP address for the MELVYL host computer which uses TCP/IP protocol.

Omnet's ScienceNet electronic mail service on Telemail has set up a gateway to the Internet address corresponding to the MELVYL Catalog for the University of California Libraries. From Omnet's "Command?" prompt, type GOTO XDATA. At the "connect me to" prompt, type MELVYL. To return to Omnet's electronic mail, type GOTO MAIL.

A wide variety of library catalogs are accessible for free over the Internet. Library catalogs from large and small academic libraries from several states are available. Library catalogs will vary in completeness in listing a library's book holdings. Many libraries are in the process of creating database records for books acquired before the library automated. Most library catalogs provide help screens or onscreen advice on how to search. Once connected via the Internet, you can usually figure out what to do by using onscreen help or asking for help.

The largest catalog currently available for free over the Internet is the MELVYL catalog of the University of California. Since several of the largest academic libraries in the US are part of the University of California, MELVYL is worth searching for your information needs. Due to the breadth and depth of the collections of the University of California libraries, MELVYL will retrieve many listings for books on particular topics. Library catalogs for institutions outside California would be appropriate for determining what is locally available; however they may not be as comprehensive as MELVYL.

INTERNET-ACCESSIBLE LIBRARY CATALOGS  
as of February 2, 1990

Arranged alphabetically by state, each listing provides the Internet address of the library catalog and any pertinent

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logon protocol. An unabridged version of this list is available from a listserver addressed at [LISTSERV@UNMVM](mailto:LISTSERV@UNMVM). In order to receive the latest information on library catalogs available on the Internet, send the message GET INTERNET LIBRARY to this listserver.

Library catalogs listed:

UNIVERSITY OF CALIFORNIA MELVYL CATALOG  
UNIVERSITY OF CALIFORNIA BERKELEY  
COLORADO ALLIANCE OF RESEARCH LIBRARIES  
UNIVERSITY OF DELAWARE LIBRARIES  
FLORIDA STATE UNIVERSITY LIBRARIES  
EMORY UNIVERSITY LIBRARIES  
UNIVERSITY OF ILLINOIS AT CHICAGO  
UNIVERSITY OF NOTRE DAME LIBRARY  
UNIVERSITY OF KANSAS LIBRARY  
UNIVERSITY OF MARYLAND LIBRARIES  
BOSTON UNIVERSITY  
UNIVERSITY OF MICHIGAN  
UNIVERSITY OF MINNESOTA LIBRARIES  
DARTMOUTH COLLEGE LIBRARY  
PRINCETON UNIVERSITY LIBRARY  
UNIVERSITY OF NEW MEXICO LIBRARY  
NEW MEXICO STATE UNIVERSITY LIBRARY  
CORNELL UNIVERSITY LIBRARIES  
NEW YORK UNIVERSITY LIBRARY  
RENSSELAER POLYTECHNIC INSTITUTE LIBRARY  
STATE UNIVERSITY OF NEW YORK AT BINGHAMTON LIBRARY  
UNIVERSITY OF OREGON LIBRARIES  
PENNSYLVANIA STATE LIBRARIES  
LEHIGH UNIVERSITY  
UNIVERSITY OF PENNSYLVANIA LIBRARIES  
BROWN UNIVERSITY LIBRARY  
UNIVERSITY OF TENNESSEE LIBRARY  
TEXAS A&M LIBRARIES  
UNIVERSITY OF TEXAS ARLINGTON LIBRARY  
UNIVERSITY OF TEXAS AUSTIN LIBRARY  
UNIVERSITY OF TEXAS DALLAS LIBRARY  
VIRGINIA POLYTECHNIC INSTITUTE & STATE UNIVERSITY

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UNIVERSITY OF CALIFORNIA MELVYL CATALOG  
Telnet to [MELVYL.UCOP.EDU](telnet://MELVYL.UCOP.EDU) (31.1.0.11)

MELVYL is an online catalog listing books owned by

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University of California libraries and journals owned by University of California, California State Universities & Colleges, Stanford University, and University of Southern California. MELVYL has over 5 million book records, over 640,000 serial records, and is the largest free catalog accessible over the Internet. MELVYL lists all of the Scripps Institution of Oceanography Library's books in addition to books from libraries at all of the nine University of California campuses.

#### UNIVERSITY OF CALIFORNIA BERKELEY

Telnet to GopAC.BERKELEY.EDU (128.32.159.19)

#### COLORADO ALLIANCE OF RESEARCH LIBRARIES (CARL)

Telnet to pac.carl.org (192.54.81.128)

CARL accesses many Colorado library catalogs including Auraria, Colorado School of Mines, Colorado University at Boulder, Denver University, University of Northern Colorado, University of Wyoming. CARL catalogs contain over 4 million records. CARL also offers access to journals owned by the Boston Library Consortium, a cooperative association of academic and public libraries in the Greater Boston area, including Tufts University, Boston University, University of Massachusetts, Brandeis University, MIT, Northeastern University.

#### UNIVERSITY OF DELAWARE LIBRARIES

Telnet to DELCAT.UDEL.EDU or DELCAT.ACS.UDEL.EDU or 128.175.13.6.

After connected to DELCAT, press the RETURN key to see a list of valid terminal types. You may have to press the RETURN key 2-3 times. If you have connected in line mode, use TYPETERM as your terminal type. If you are using a Sun workstation, use VT100 as your terminal type. You should also telnet to DELCAT from a "csh-tool" window. Do not telnet from a "cmd-tool" window. Otherwise, select the terminal type closest to the one you are using. In response to the ENTER TERMINAL TYPE: prompt, type your terminal type and press the RETURN key. Press the RETURN key again when the "Welcome to DELCAT" screen appears, and follow the directions. To log off DELCAT, type either QUIT or EXIT and press the RETURN key.



#### FLORIDA STATE UNIVERSITY LIBRARIES

Telnet to nervm.nerdc.ufl.edu

Use a tn3270 version of telnet to connect to nervm.nerdc.ufl.edu. After reaching nervm, press enter to get past the VM logo screen. CP READ will be displayed in the lower right corner. Type DIAL VTAM and press enter. The screen will clear. The message NERDC VTAM IS ACTIVE displays; type "nerluis" on the next line and press enter. The message WELCOME TO NERLUIS displays; type "1" after ENTER SELECTION HERE and press enter. The message NERDC SECURITY MODULE displays; type "fcl" after GROUP-ID. The cursor automatically tabs to the next line after "fcl" and your operator ID, so do not press enter. Type "aaya" for both the operator ID and the password; the password will not display as it is typed. Press enter after typing the password. If you receive the message INVALID OPERATOR ID or INVALID PASSWORD, retype the ID or password in the proper space and press enter. The message SIGN-ON COMPLETE displays; press the enter key to clear the screen. Then type "luis" and press enter to display a menu showing each of the catalogs available in LUIS. Type the number associated with the desired LUIS catalog, and press enter. This places you into that card catalog. To change catalogs, type "menu" from the command line of any screen to return to the catalog menu screen. To exit LUIS, press clear key once or twice until the screen is clear. If you have problems clearing your screen with the clear key, clear the screen by typing \$\$\$ on the command line and then pressing enter. This exits the catalog you are in, but you are still signed on to LUIS. When the screen is clear, type "logoff" and press enter. When you see the message SIGN-OFF IS COMPLETE, you are logged off and the message NERDC VTAM IS ACTIVE will reappear. You are not logged off if you do not see these messages. To terminate the telnet connection, type UNDIAL and press enter when the NERDC VTAM IS ACTIVE message reappears.

#### EMORY UNIVERSITY LIBRARIES

Telnet to host emuvvm1.cc.emory.edu (128.140.1.4).

After the VM screen displays, press ENTER to get CP READ. Type DIAL VTAM and press ENTER. At the VTAM screen, type LIB and press ENTER. When the CICS screen appears, press the PF1 key. The next screen will be the initial library systems screen. To exit, terminate the telnet connection.

UNIVERSITY OF ILLINOIS AT CHICAGO

Telnet to UICVM.UIC.EDU (128.248.2.50)

An introductory screen, with "more" in right corner, displays. Press Clear key. The UIC FLAME displays. Press the Enter key. The LOGON screen displays. Type DIAL PVM. The PVM (Passthru) screen displays. Move cursor to NOTIS & press Enter key. A one line message about port in use displays. Press the Enter key and the LUIS introductory screen displays. To exit, type ####. The PVM (Passthru) screen displays. Type PA1; the same PVM screen displays with Telnet message in lower left. Type QUIT and the message "Enter to return" displays. Press the Enter key.

UNIVERSITY OF NOTRE DAME LIBRARY

Telnet to IRISHMVS.CC.ND.EDU (129.74.4.5)

At the ENTER COMMAND OR 'HELP': prompt enter "library" and press the enter key. You will be logged onto the library system via SIM3278 either as a VT100 terminal or a 3278-2 terminal. #HELP gets SIM3278 help. The rest of the instructions are on the screen (after clearing the intro logo). To leave, type x on the command line and press the enter key. At the ENTER COMMAND OR 'HELP': prompt, type bye and press the enter key.

UNIVERSITY OF KANSAS LIBRARY

Telnet to KUHUB.CC.UKANS.EDU (129.237.1.10)

The message "Username:" displays; type "relay <cr>". A welcome screen displays; type ".lc <cr>". The prompt "Enter Terminal Type:" displays. There are many choices but if emulating a VT100, type "vt100k <cr>". The TERMINAL NETWORK screen displays; type "ocat <cr>". A banner screen appears; type "<esc> <esc> ocat <cr>".

UNIVERSITY OF MARYLAND LIBRARIES

Telnet to UMCAT.UMD.EDU (128.8.161.199)

If blank screen appears, type CAT to access the online catalog.

BOSTON UNIVERSITY

Telnet to LIBRARY.BU.EDU (128.197.4.200)

UNIVERSITY OF MICHIGAN

Telnet to CTS.MERIT.EDU (35.1.1.6)

After telnetting, you may have to type a <cr> for the system to recognize your presence. When prompted for terminal type, VT100 is the recommended response. A prompt asks "Which Host?". Enter "mirlyn". After prompting for confirmation of terminal type, the catalog screen displays. To exit, type "<ctrl-e>%quit", or disconnect your telnet.

UNIVERSITY OF MINNESOTA LIBRARIES

Telnet to LUMINA.LIB.UMN.EDU (128.101.92.3)

To exit, break the connection from your end.

DARTMOUTH COLLEGE LIBRARY

Telnet to lib.dartmouth.edu (129.170.48.5)

PRINCETON UNIVERSITY LIBRARY

Telnet to PUCABLE.PRINCETON.EDU

When a Connect message followed by a blank screen display, press enter key. System responds #; type "Call 500". To exit, type "end."

UNIVERSITY OF NEW MEXICO LIBRARY

Telnet to BOOTES.UNM.EDU

At login prompt, enter STUDENT1.....STUDENT6. No password is required. Select Library from main menu.

NEW MEXICO STATE UNIVERSITY LIBRARY

Telnet to LIBRARY.NMSU.EDU

At the ":", enter "hello user.lib01"

CORNELL UNIVERSITY LIBRARIES

Telnet to CORNELL.CIT.CORNELL.EDU (128.253.1.19)

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Connection is via T3270. System prompts "enter host name"; type cornellc <enter>. Cornell banner displays and LOGON prompt appears; press <enter> or <clear>. CP READ CORNELLC displays; type library <enter>. To exit, at arrow prompt, type x <enter> which returns to TN3270. Exit TN3270 to end the session.

NEW YORK UNIVERSITY LIBRARY

Telnet to BOBCAT.NYU.EDU (128.122.138.2)

Hit return to wake up a port. Type END to disconnect.

RENSSELAER POLYTECHNIC INSTITUTE LIBRARY

Telnet to infotrac.rpi.edu (128.113.1.31)

Once connected, terminal type is prompted. Type ? for a list. After entering terminal type, a banner displays, and a request to type "return".

STATE UNIVERSITY OF NEW YORK AT BINGHAMTON LIBRARY

Telnet to BINGVMC.CC.BINGHAMTON.EDU (128.226.1.4)

You must use the "tn3270" command to access. After telnetting, type "dial vtam". From VTAM menu screen, type "elixir". To exit, clear screen (CTRL-Z works with tn3270) and type "off" <ENTER>. Type "undial" <ENTER> and the Internet connection will be closed.

UNIVERSITY OF OREGON LIBRARIES

Telnet to JANUS.UOREGON.EDU (128.223.20.86)

You must be on a VT100, Wyse, or TVI925 terminal or emulator to be able to access catalog. After telnetting, press <return> several times. After prompting for terminal type, type "v" for VT100 (must be lowercase).

PENNSYLVANIA STATE LIBRARIES

Telnet to lias.psu.edu (128.118.25.13)

VT100 emulation is required.

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LEHIGH UNIVERSITY

Telnet to asa.lib.lehigh.edu (128.180.2.13)

VT100 emulation is Required.

UNIVERSITY OF PENNSYLVANIA LIBRARIES

Telnet to pennlib.upenn.edu (128.91.200.32)

VT100 emulation is required.

BROWN UNIVERSITY LIBRARY

Telnet to BROWNV.M.BROWN.EDU

Press <cr> at the BROWNV.M logon screen. At the VM logon screen type DIAL JOSIAH <cr>. The passthru menu should display. TAB to any of the choices on the screen and <cr> To exit, press the PF10 key to display the logoff option and choose the option from the menu. Press the PF3 key. At the passthru menu, press the PA1 key and type QUIT <cr>.

UNIVERSITY OF TENNESSEE LIBRARY

Telnet to DCA.UTK.EDU (128.169.200.68)

At the "ENTER HOST NAME OR HELP" prompt, type "LIBRARY" to connect to the system.

TEXAS A&M LIBRARIES

Telnet to VENUS.TAMU.EDU (128.194.4.1)

At the Username: prompt, type VTAM. At the Texas A&M Statewide Network screen, type NOTIS. At the CICS screen, hit RETURN. To exit, hit CTRL-Z.

UNIVERSITY OF TEXAS ARLINGTON LIBRARY

Telnet to ADMIN.ARL.UTE XAS.EDU (129.107.1.103)

As soon as you are connected, hit RETURN. At the TERMINAL TYPE prompt, type VT100. At VTAM selection menu, type NOTIS. At CICS Logo Screen, press RETURN. On next screen, type LUUT. To exit, hit Keypad ENTER followed by PF4. Type LOGOFF. Type LOGOFF again. Some terminal packages remap the keyboard. For example, in Procomm Keypad ENTER is SHIFT-F10 and PF4 is SHIFT-F2. Keypad ENTER is equivalent to ESC O M. PF4 is equivalent to ESC O S.

UNIVERSITY OF TEXAS AUSTIN LIBRARY

Telnet to UTAUS.CC.UTEXAS.EDU (128.83.1.125)

At the Username: prompt, enter UTCAT. Press 1 and the Keypad ENTER key at the UT Library Information Systems screen. At the Welcome to the UT Library Online Catalog screen, press the Keypad ENTER key. To exit, type STOP followed by Keypad ENTER. Type 4 followed by Keypad ENTER Please note that some terminal packages remap the keypad ENTER key to other keys. For example, in Procomm the equivalent to Keypad ENTER is Shift-F10. Keypad ENTER is equivalent to ESC O M.

UNIVERSITY OF TEXAS AT DALLAS LIBRARY

Telnet to IBM.UTDALLAS.EDU (129.110.102.1)

Choose VT10x as terminal type. Hit Enter to clear login screen. Type "library" to enter the catalog.

VIRGINIA POLYTECHNIC INSTITUTE & STATE UNIVERSITY

Telnet to 128.173.1.4

Telephone access to the CBX is provided through an inbound modem pool at phone number 703-231-4000. Speeds up to 2400 baud are accepted. There is no charge at this time for dialing into the CBX.

After getting the prompt, type CALL VTLS to connect.

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DIALING INTO THE UNIVERSITY OF CALIFORNIA MELVYL CATALOG

For those that cannot access the University of California MELVYL online catalogs via the Internet, some University of California campuses support open-access dial-in lines to the MELVYL catalog. Non-UC usage of the MELVYL catalog is a low percentage of overall use so access through the Internet has not created problems. The dial-in lines are limited in the number of simultaneous users that they will support. While the phone numbers are not secret, they are usually given out only upon request in order to avoid congested phone lines. It is to your advantage as a dial-in user to avoid

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disseminating these numbers widely in order to ensure your own ready access to the MELVYL catalog.

THROUGH UC BERKELEY,

Set communications software:

Baud Rate: 300, 1200, 2400  
Data Bits: 7          Parity: Even          Duplex: Full  
Stop Bits: 1          Xon/Xoff: Yes          Auto LF: No  
Strip Chars: No

Dial one of these numbers: (415)642-9721 (300 baud);  
                                  (415)642-7400 (1200 baud);  
                                  (415)642-6870 (1200 baud; Racal-  
  Vadic modems work only  
  with this number);  
                                  (415)642-6092 (2400 baud);  
                                  (415)642-6095 (2400 baud)

At the "Request" prompt: Type NETWORK <enter>.

When "connecting" appears, press <enter>.

Then type MELVYL <enter>.

Once in the MELVYL Catalog, enter "?" at the "Terminal?" prompt to find the code for your computer.

To Logoff, type END <enter>; then LOGOFF <enter>.

THROUGH UC SAN FRANCISCO,

Set communications software: 7 data bits,  
                                  1 stop bit,  
                                  Even or Mark parity.

Dial one of these numbers:

San Francisco - (415) 476-5671/5301 (1200 bps),  
                                  (415) 476-3911 (300 bps),  
                                  (415) 476-6355 (2400 bps);  
Berkeley -       (415) 642-6054 (1200 bps),  
                                  (415) 642-6050 (300 bps),  
                                  (415) 459-2932 (1200/2400 bps)

When you see ENTER CLASS, type 5 <CR>; <CR>=Press ENTER key

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When you see GO, press <CR> 1 to 3 times (there may be a delay of up to 1 minute) until you get the message: "DLA LINE xxx (TELNET) ... (MELVYL.UCOP.EDU)"

When you see ENTER YOUR TERMINAL TYPE, type: i99 <CR> for an IBM-PC, or type help <CR> for a list of terminal types

To exit, type: end <CR>

THROUGH UC SANTA BARBARA,

Dial one of these numbers: (805) 961-8400 (2400 baud),  
(805) 961-8190 (1200 baud),  
(805) 961-8180 (300 baud)

Press the ENTER key twice.

The response is: YOU MAY NOW ENTER NET / ONE COMMANDS

Type in: c (press space bar) SBMELVYL (enter key)

The Net will respond: Connecting... (8) 32978a1 Success

Type in: \_ (enter key)

The Net will respond:

TCP Trying...Open

DLA Line 217 (TELENET) 17:25:30 00/00/00

Please Enter Your Terminal Type Code or Type HELP for a List of Codes. TERMINAL?

Type in terminal code. Type HELP if you do not know your terminal type. If not listed type Z99.

To exit, type end (enter key)

THROUGH UC SAN DIEGO,

Dial one of these numbers:

Phone #	Speed (bps)	Notes
(619)534-6900	300/1200/2400	MNP level 1-5; preferred access number
(619)452-8280	300/1200 only	Tri-Standard
(619)452-9813	PEP (high speed data)	Telebit (19,200 bps)



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(these phone numbers will be changing mid-1990)

When connected, press [enter] or [return] key until prompt:  
You may now enter NET/One commands

Determine your escape sequence by issuing the command: list  
(You will need to note the escape sequence for disconnecting  
from the network after logging off of the MELVYL Catalog.)

- a. If escape sequence is "none", enter the command:  
set disconnect %d or  
set disconnect [ctrl] e \*  
(pressing ctrl key and e at same time)
- b. If escape sequence is specified, enter the command:  
set disconnect <whatever it was>

Type: connect melvyl [enter]; you will see response:  
Connecting . . . . (N) NNNN Success

Type: @r [enter]; you will see response:  
Welcome to the DLA Network.

Type: @n [enter]

You will then be prompted for your terminal type. (Enter  
help command for a list of terminal types.)

Type: <your terminal type> [enter]; you will now be in the  
MELVYL Online Catalog.

To exit, enter the command: logoff (twice)

To disconnect from the network, enter the escape sequence  
noted above.

THROUGH UC SAN DIEGO ETHERNET (TELNET) SERVICE,

Dial one of these numbers

Phone #	Speed (bps)	Notes
(619)534-6908	300/1200/2400	MNP level 1-5
(619)452-4390	PEP/V.32	Telebit T2500

When connected, press [enter] or [return] key until you see  
several lines of information, ending with the prompt: Annex:

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Type: telnet melvyl, and press [enter] key.

You will then be prompted for your terminal type. See above.

To exit, type the command: logoff (twice)

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SEARCHING THE UNIVERSITY OF CALIFORNIA'S  
MELVYL ONLINE CATALOG

WHAT IS MELVYL? MELVYL is an online catalog listing books owned by the nine University of California libraries, the California State Library, & the Center for Research Libraries. MELVYL also lists serials and journals owned by UC, the California State Universities, Stanford University, University of Southern California, Getty Center, & Center for Research Libraries.

MELVYL has over 5 million book records & over 640,000 serial and journal records. MELVYL lists all of the Scripps Institution of Oceanography Library's books and serials (Scripps Library's technical reports collection is listed by serial entry). Libraries vary in the completeness of their holdings on MELVYL; the collection of the Scripps Library is almost complete represented with most technical report series searchable only as a series only.

Use MELVYL for subject searches, verifying incomplete references, and getting the full titles of journals by searching journal title abbreviations. Avoid using MELVYL during peak usage periods: between 10am - 6pm PST & particularly between 1pm - 5pm PST.

GETTING STARTED: Search MELVYL in command mode & not lookup mode. Command mode will save you time. If you need help from MELVYL type "help". You can also type "help" followed by the name of the feature that you need help with, eg HELP FIND.

Use the Boolean logical operators "and", "or", and "and not"; omit "and" between search terms since Melvyl automatically reads adjacent terms as having an implied "and" between them.

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There are two basic commands "FIND" and "DISPLAY"; type them as "F" and "D" respectively. The FIND command is followed by the field in which the search is to be executed (AU,TW,SU) and then by the search terms. The DISPLAY command is entered by itself to see all records retrieved or followed by specific record numbers.

MELVYL's truncation (wild card) symbol is #. Truncation is used to search for all variations of a root term; for example specifying "ocean#" will yield "ocean", "oceans", "oceanic", "oceanographic", "oceanography" etc. Use truncation whenever possible.

#### SAMPLE MELVYL RECORDS

A regular record for a book will give author, title, editor if appropriate, publisher, year, and UC library holdings.

Conference on Coastal Engineering Instruments (1st : 1955 : Berkeley, Calif.)

Proceedings of the first Conference on Coastal Engineering Instruments : Berkeley, California, October 31-November 2, 1955 / edited by R.L. Wiegel. Richmond, Calif. : Council on Wave Research, The Engineering Foundation, 1956.

UCD Phys Sci GC41 .C6 1955  
UCSB Library TC203 .C62 Sci-Engrg  
UCSD Scripps GC41 .C63

A full-length record for a book will give all of the above plus Library of Congress subject headings and additional descriptive notes about the book (eg pagination).

Conference on Coastal Engineering Instruments (1st : 1955 : Berkeley, Calif.)

Proceedings of the first Conference on Coastal Engineering Instruments : Berkeley, California, October 31-November 2, 1955 / edited by R.L. Wiegel. Richmond, Calif. : Council on Wave Research, The Engineering Foundation, 1956.

Description: vii, 302 p : ill. ; 27 cm.

Notes: Cover title: Coastal engineering instruments. includes bibliographies.

Subjects: Oceanographic instruments -- Congresses.

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Ocean waves -- Congresses.

Hydraulic measurements -- Congresses.

AUTHOR / TITLE SEARCHING: If you know the author & title of a book, FIND it by the title. Exact title searching (XT) is the best because it is the fastest. When searching exact titles, type in only the first four or five words of the title. MELVYL will automatically truncate after the last word typed in an exact title search & you can avoid unnecessary typing.

When title keyword searching for a book, type about four of five unique keywords; don't type in every title keyword.

Search ampersands as "&" and not as the word "and".

For example,

search for title keywords: F TW OCEANOGRAPHY ATLANTIC

search for exact title: F XT PHYSICAL OCEANOGRAPHY

Author searching is useful but should be avoided. One never knows how the author's first & middle names appear (complete or initials). For non-Roman alphabets, one is never certain how author's names are transliterated, eg Y and I in Russian.

For example,

search for personal authors: F PA SMITH JOHN

search for corporate author: F CA CONFERENCE COASTAL  
ENGINEERING INSTRUMENTS

search for personal or corporate authors by F AU SEARS

BOOK SERIES SEARCHING: F SE can search for the book series number in addition to the book series name.

For example, F SE PROCEEDINGS SPIE 1106 locates the book entitled "Future infrared detector materials" which is volume 1106 of the Proceedings of SPIE--the International Society for Optical Engineering.

SUBJECT SEARCHING: Search for books by subject using Library of Congress subject headings. Exact subject searching (XS)

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is the best because it is the fastest.

For example,

search by LC subject headings: F SU SUBMARINE CANYONS  
search by exact LC subject heading: F XSU ACOUSTIC IMPEDANCE

If you want to review appropriate headings online, use the BROWSE command. BROWSE ELECTRONICS will list all subject headings containing the word "electronics". Use the SELECT command to pick out those subject headings of interest. and then DISPLAY their corresponding records.

Combined title keyword & subject searches are best; do not rely solely on subject headings if comprehensive retrieval is desired.

PERIODICAL SEARCHING: F PE searches for keywords in serial/periodical titles. F XPE searches for an exact title of a serial/periodical & is quicker.

For example,

search for periodicals by F PE CONTROL INSTRUMENTATION.  
search for exact periodical by F XPE CHEMICAL BIOMEDICAL AND ENVIRONMENTAL INSTRUMENTATION

Do not guess on periodical title abbreviations unless you are certain. Instead, use truncation on the abbreviated periodical title words. F PE ADV# INSTRUMENT# finds Advances in Instrumentation. You cannot search on abbreviations less than three letters. Common abbreviations (REV, SCI, COMM, INT) will be rejected during peak usage periods & will be searched readily in low usage periods.

F RPE or F RXPE will retrieve all records comprising the title history of the periodical being searched.

SERIES OR SERIAL??? Libraries vary in cataloging practice; what one catalogs as a serial/periodical could be a book series to another.

"Proceedings of SPIE--the International Society for Optical Engineering" can be searched as a serial/periodical with a F PE search (example 1) and as a book series with a F SE search (example 2). Different libraries may appear with each

search!

Always search numbered series and serials/periodicals both ways: PE & SE.

Example 1 of a F PE search for a serial/periodical:

F PE PROCEEDINGS SPIE

Proceedings of SPIE--the International Society for Optical Engineering. Bellingham, Wash. : SPIE--the International Society for Optical Engineering, c1981-

UCD	PHY SCI	TS510 S63	266,1981-
UCI	MAIN LIB	TS 510 P632	bn1039(1988)
UCSC	SCI LIB	QC370.5.S6	266(1981)+;

Example 2 of a F SE search for one item in a book series:

F SE PROCEEDINGS SPIE 1106

Future infrared detector materials : 29-30 March 1989, Orlando, Florida / Jan W. Baars, Randolph E. Longshore, chairs/editors ; sponsored by SPIE--the International Society for Optical Engineering ; cooperating... Bellingham, Wash., USA : SPIE, c1989.

Series title: Proceedings of SPIE--the International Society for Optical Engineering ; v. 1106.

UCB	Engin	TA1570 .F88	1989
UCI	Main Lib	TS510 .P632	vol. 1106
UCSD	S & E	TA1570 .F88	1989

LINKING SEARCHES: Several searches can be linked in one statement. Searches can be narrowed in subsequent statements. Use the BACKUP command to go back one search step.

- 1) F TW PACIFIC OCEAN OR SU PACIFIC OCEAN
- 2) AND NOT TW SAILING

LIMITING BY LANGUAGE & DATE: FIND search statements can be suffixed with limiting statements.

....AND LAN JPN (3 letter language codes)  
....AND LAN ENGLISH (full language name)  
....AND DATE CURRENT (last 3 years plus current year)  
....AND DATE RECENT (last 10 years plus current year)  
....AND DATE 1959 or earlier

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...AND DATE 1946 (individual years)  
...AND DATE 1931-1933 (3 year range 1900-1959)  
...AND DATE 1870-1874 (5 year range 1800s)  
....AND ADDED SINCE MM/DD/YY (update a search)

DISPLAY: Records are displayed using the display command "D".  
Use the CONTINUOUS display format when downloading in order  
to avoid screen-by-screen display.

For example,

display all results by typing D CONT  
display specific records by typing D CONT and specific record  
number(s)

display brief results by typing D CONT REV with or w/o nos.

display full record by typing D CONT LONG with or w/o nos.  
Displaying the full record shows LC subject headings  
which suggest further searches that can be pursued.

SAVE & LIST: SAVE command is used to compile selected  
records into a LIST for subsequent DISPLAY. During (or  
after) scanning many records, use SAVE to place selected  
record numbers into a personal LIST. Then, after scanning is  
finished, DISPLAY LIST to get those selected records.

SAVE & LIST are best used to scan & pick from large  
retrievals. First, download a large retrieval in title  
format, eg D TI. Logoff & review the title listing for  
desired records. Logon & rerun the same search. Then, SAVE  
the desired record numbers into a LIST, eg SAVE 1 14 22 35 53  
67 88 101 121. Next, D LIST CONT to download the selected  
records.

For small retrievals, it is better to simply download all  
records & then edit out the rejects offline using  
wordprocessor.

#### SOME GENERAL PRINCIPLES FOR REMOTE USERS

- \* Once connected, all MELVYL Catalog features are available
- \* Normal DISPLAY output is one screen at a time. To adjust
  - for downloading, use DISPLAY CONTINUOUS
  - for printing, use DISPLAY PRINT
- \* During a MELVYL Catalog session, the HELP command will  
provide instructions and advice, without losing your place

in a search

- \* HELP DOWNLOAD provides advice about capturing results
- \* HELP SAVE explains how to create a bibliography of up to 200 records out of any number of searches during your MELVYL session, which can then be downloaded together.

For online help messages during a MELVYL Catalog session, the following commands are available at any time during a MELVYL session. You will not lose your place.

HELP.....System will provide help  
                                  for your current situation  
HELP COMMAND.....for information on MELVYL commands  
HELP FIND.....for help with search options  
HELP DISPLAY.....for help with display options  
HELP LIST.....how to select your own bibliography  
                                  from various search results  
HELP GLOSSARY.....an index to all available help  
                                  screens  
SHOW NEWS.....for a menu of system news

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#### PRINTED INDEXES & ABSTRACTING JOURNALS

Printed indexes and abstracting journals have long been available for keeping up with the scientific literature and retrospective reviewing of the scientific literature. Printed indexes and abstracting journals have largely been eclipsed by their equivalent databases due to the convenience of database searching.

Printed indexes and abstracting journals, while not as exciting as a database, can be used effectively for keeping up with a field by browsing the literature. Printed indexes and abstracting journals usually cover several thousand journals of which any one library will only subscribe to a fraction.

References in most printed indexes and abstracting journals are arranged by a broad subject classification. Thus all references on instrumentation and its applications are arranged together in each monthly issue of Electrical & Electronics Abstracts. Electrical & Electronics Abstracts' broad subject section INSTRUMENTATION AND SPECIAL



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APPLICATIONS has references arranged under specific sections like SIGNAL PROCESSING, SENSING DEVICES, ELECTRIC AND MAGNETIC VARIABLES, NONELECTRIC VARIABLES, GEOPHYSICAL INSTRUMENTS. Other subject sections in Electrical & Electronics Abstracts cover radar, telemetry, antennas, lasers, filters, fiber optics, etc.

By scanning references in the subject classification(s) of interest, one can effectively keep up with a large body of literature. Wide ranging browsing cannot be accomplished on a database due to the economic limitations imposed by database charges for connect-time and citations.

#### ELECTRICAL & ELECTRONICS ABSTRACTS

Produced under the auspices of the IEEE and IEE, ELECTRICAL & ELECTRONICS ABSTRACTS abstracts recent technical developments worldwide in electronics, radio, telecommunications, optoelectronics, and electrical power. Premier abstracting journal for electronics. EEA contains up to 84,000 abstracts in 12 monthly issues. EEA costs \$1660 per year so look for it in libraries serving an engineering clientele. Subset of INSPEC database.

A titles-only version (no abstracts) of ELECTRICAL & ELECTRONICS ABSTRACTS is available for \$165 per year for IEEE/IEE members and \$255 per year for non-members. Entitled CURRENT PAPERS IN ELECTRICAL & ELECTRONIC ENGINEERING, the subject coverage is the same as the corresponding complete version with abstracts. This titles-only version offers good value in keeping up the literature.

#### COMPUTER & CONTROL ABSTRACTS

Produced under the auspices of the IEEE and IEE, COMPUTER & CONTROL ABSTRACTS abstracts all aspects of computer installations, applications, hardware, peripherals, software, and theory as well as control engineering, robotics, systems theory, and artificial intelligence. Premier abstracting journal for computers. CCA contains up to 77,000 abstracts in 12 monthly issues. CCA costs \$1080 per year so look for it in libraries serving an computer sciences clientele. Subset of INSPEC database.

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A titles-only version (no abstracts) of COMPUTER & CONTROL ABSTRACTS is available for \$165 per year for IEEE/IEE members and \$255 per year for non-members. Entitled CURRENT PAPERS ON COMPUTERS & CONTROL, the subject coverage is the same as the corresponding complete version with abstracts. This titles-only version offers good value in keeping up the literature.

#### PHYSICS ABSTRACTS

Produced under the auspices of the IEEE and IEE, PHYSICS ABSTRACTS abstracts all areas of physics including particle, nuclear, atomic, molecular, fluid, plasma and solid-state physics, biophysics, geophysics, astrophysics, measurement, and instrumentation. Premier abstracting journal for physics. PA publishes over 154,000 abstracts in 24 biweekly issues. PA costs \$2190 per year so look for it in libraries serving a physics clientele. Subset of INSPEC database.

A titles-only version (no abstracts) of PHYSICS ABSTRACTS is available for \$200 per year for IEEE/IEE members and \$290 per year for non-members. Entitled CURRENT PAPERS IN PHYSICS, the subject coverage is the same as the corresponding complete version with abstracts. This titles-only version offers good value in keeping up the literature.

#### ENGINEERING INDEX

Published by Engineering Information and derived from part of the COMPENDEX PLUS database, ENGINEERING INDEX provides abstracts to worldwide engineering and technical literature encompassing all engineering disciplines as well as related fields in science and management. Chemical, civil, electrical and electronics, mechanical, metallurgical, materials, mining, and petroleum engineering are covered in addition to engineering geology, marine engineering, industrial engineering, bioengineering, energy, transportation, and robotics. Primary emphasis is on the journal literature and conference proceedings; coverage also includes books and dissertations but patents are excluded. Over 4500 primary sources are monitored with about 7,000 items in each monthly issue. Approximately 90% of the items are in English though 50% are published outside the US. Items are arranged in each issue under general subjects in

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order to facilitate keeping up with the literature. Premier abstracting journal for engineering. Annual subscription cost is \$1625; cumulative index costs another \$1500.

#### BIBLIOGRAPHY AND INDEX OF GEOLOGY

Published by the Geological Society of America and the American Geological Institute and derived from the GeoRef database, the BIBLIOGRAPHY AND INDEX OF GEOLOGY is the premier index for the worldwide geology and geophysics literature including marine geology. A wide range of literature is indexed including books, journal articles, conferences, maps, dissertations, government documents and survey reports. No abstracts are available for items being indexed. Over 8000 journals are scanned annually with over 7000 items indexed in each monthly issue. Items are arranged in each issue under general subjects in order to facilitate keeping up with the literature. Approximately 70% of the items are in English. An annual subscription costs \$1200.

#### OTHER PRINTED INDEXES

METEOROLOGICAL & GEOASTROPHYSICAL ABSTRACTS, published by the American Meteorological Institute, is the premier abstracting journal for meteorology and climatology. Though extremely tardy in covering the literature, there is no other abstracting journal or index that compares. A database of the same name corresponding to the abstracting journal is available on Dialog Information Service. Coverage of geophysics in METEOROLOGICAL & GEOASTROPHYSICAL ABSTRACTS is not as strong as the coverage in the BIBLIOGRAPHY AND INDEX OF GEOLOGY. An annual subscription costs \$600 with the cumulative index costing \$150.

SCIENCE CITATION INDEX, published by the Institute for Scientific Information, covers the top 3300 scientific journals in all scientific disciplines. 10 million items are indexed each year. SCIENCE CITATION INDEX is noteworthy for its citation indexing used to identify articles citing an earlier work. One looks up an older journal article in the citation index and then finds out subsequent articles citing it from the year of publication to present. This is very helpful for bringing a topic (as encapsulated in a journal article) up to date. However, since SCIENCE CITATION INDEX covers only the top 3300 journals in all of science (biology,

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medicine, psychology, chemistry, geology, physics, engineering, etc), you will only find out those articles in the top journals that cited an earlier article. There will be many more articles published in journals not covered by SCIENCE CITATION INDEX that will also have cited that earlier article.

Similarly, since SCIENCE CITATION INDEX covers only the top 3300 journals in all of science, SCIENCE CITATION INDEX should not be relied upon for a thorough look at the engineering literature when doing looking up for articles by author or subject. SCIENCE CITATION INDEX's greatest value is its citation indexing; author- or subject-oriented searches should be executed in more comprehensive indexes like ENGINEERING INDEX or ELECTRICAL & ELECTRONICS ABSTRACTS.

#### PRINTED CURRENT AWARENESS SERVICES

##### KEY ABSTRACTS: ELECTRONIC INSTRUMENTATION

Published monthly, KEY ABSTRACTS: ELECTRONIC INSTRUMENTATION presents current abstracts on electrical instrumentation from the INSPEC database. Annual subscription from INSPEC is \$72 for IEEE/IEE members and \$130 for non-members.

##### KEY ABSTRACTS: MEASUREMENTS IN PHYSICS

Published monthly, KEY ABSTRACTS: MEASUREMENTS IN PHYSICS presents current abstracts on physical instrumentation from the INSPEC database. Annual subscription from INSPEC is \$72 for IEEE/IEE members and \$130 for non-members.

Other KEY ABSTRACTS include the following:

- COMPUTING IN ELECTRONICS & POWER
- ELECTRONIC CIRCUITS
- POWER SYSTEMS & APPLICATIONS
- ARTIFICIAL INTELLIGENCE
- MACHINE VISION
- OPTOELECTRONICS
- ROBOTICS & CONTROL
- ANTENNAS & PROPAGATION

OCEAN TECHNOLOGY & ENGINEERING: AN ABSTRACT NEWSLETTER

Published weekly, OCEAN TECHNOLOGY & ENGINEERING provides abstracts of reports on marine technology received by NTIS (National Technical Information Service). NTIS is a US-government sponsored clearinghouse for contract reports from government-sponsored research; NTIS also receives reports from many foreign agencies. Listed reports can be ordered directly from NTIS in printed copy or less expensive microfiche. Report abstracts are arranged in the weekly issues under headings like marine geophysics & geology, oceanographic vessels/instruments/platforms, marine engineering, physical/chemical oceanography, biological oceanography, hydrography, etc. An annual subscription costs \$105 and includes an annual subject index to the weekly issues.

Some recently abstracted reports include "WHOI Acoustic Telemetry Project", "Comparison of PEGASUS and combined CTD/ADCP Current Profiles off the California Coast", "Experiences with Offshore Instrumentation", "Compact Underwater Buoyancy System for Expendable Sonobuoys", "Instrumentation, Field Operations, and Data Processing for PMEL Deep Ocean Bottom Pressure Measurements", and "Development of a Scanning Laser Velocimeter for Coastal and Marine Applications.

#### OCEAN WAVE AND TIDAL ENERGY SYSTEMS

Published bimonthly, OCEAN WAVE AND TIDAL ENERGY SYSTEMS provides abstracts of published literature on all aspects of ocean thermal energy conversion systems (OTEC) and on wave and tidal power. Produced by the US Department of Energy, an annual subscription to the abstracting newsletter costs \$90. NTIS handles the subscriptions.

CURRENT CONTENTS: ENGINEERING, TECHNOLOGY, AND APPLIED SCIENCE.

CURRENT CONTENTS. PHYSICAL, CHEMICAL & EARTH SCIENCES.

CURRENT CONTENTS: AGRICULTURE, BIOLOGY, & ENVIRONMENTAL SCIENCES.

Published by the Institute for Scientific Information, CURRENT CONTENTS is the well-know weekly service that rapidly publishes the table of contents of the leading science journals. CURRENT CONTENTS is very timely for keeping up

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with the literature; table of contents pages are frequently received by ISI while the journal is in the proofing stage of production. Each section of CURRENT CONTENTS covers from 800-900 journals. The major marine biology journals are covered in the section on AGRICULTURE, BIOLOGY, & ENVIRONMENTAL SCIENCES. Each section of CURRENTS CONTENTS costs \$340 for an annual subscription.

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## DATABASES

### DETERMINING WHAT'S AVAILABLE

Guides to the scientific and technical literature list the major scientific and engineering databases. For the latest information, directories listing online databases will be more up-to-date. The best database directory is

DIRECTORY OF ONLINE DATABASES (Santa Monica, Calif : Cuadra Associates).

The DIRECTORY OF ONLINE DATABASES lists over 4000 databases available on over 600 online databanks worldwide. A subject index lists databases under general topics like aquatic sciences, business and industry directories, computers, earth sciences, electrical and electronics, engineering, and science and technology. The DIRECTORY OF ONLINE DATABASES is useful for assessing the overall availability of information especially in unfamiliar fields or disciplines.

### INSPEC DATABASE

Produced under the auspices of the IEEE and IEE, INSPEC is the leading English-language abstracting and indexing service providing abstracts and source information from the world's published literature on all aspects of physics, electronics, and computing.

Each year, INSPEC scans papers published in approximately 4200 technical journals and over 1000 conference proceedings, books, and reports. The INSPEC database contains over 3.5 million records with 263,000 added each year.

INSPEC coverage of electrical engineering and electronics:

electronic components and technology, telecommunications, power engineering and instrumentation, aerospace electronics, antennas and propagation, biomedical engineering, circuitry, energy conversion, insulation, lasers, magnetic devices, measurement, microwave technology, microelectronics, military electronics, nuclear instrumentation, optical and optoelectronic devices, power generation and supply, printed circuits, radar, radiocommunications, radio and television, semiconductor technology, signal processing, superconductors

INSPEC coverage of computers, computing, and control technology:

artificial intelligence, expert systems, computer theory, data and signal processing, computer-aided analysis and design, computerized control and instrumentation hardware including elements, circuitry, storage, peripheral equipment, networking software including engineering, systems, and techniques

INSPEC coverage of physics:

physics of solids, liquids, gases, plasmas, molecules, atoms, nuclei and elementary particles  
mechanics, heat, optics, acoustics, magnetism, electricity  
applied physics, instrumentation, lasers, nuclear power, semiconductors, superconductors  
astronomy, astrophysics, biophysics, energy research, environmental science, geophysics, materials science

INSPEC database coverage varies depending on the online databank. BRS, BRS AfterDark, Dialog, ORBIT, and STN coverage goes back to 1969. Data-Star coverage goes back to 1970. Dialog Knowledge Index coverage goes back to 1977.

Depending on the databank, connect-time cost ranges from \$1.83/minute to \$2.15/minute (including telecommunication cost) and citation charges range from \$0.57 each to \$0.70 each. The least expensive access to INSPEC is through reduced-rate after-hours online databanks like Dialog's Knowledge Index and BRS' After Dark. On Knowledge Index, INSPEC costs \$0.40/minute connect-time with no citation charges. On BRS' After Dark, INSPEC costs \$0.32 - \$0.35 per

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minute connect-time with citations costing \$0.06 each. As you can see, after-hours rates are extremely low and are the way to go for do-it-yourself searchers.

#### COMPENDEX PLUS DATABASE

Produced by Engineering Information, the COMPENDEX PLUS database abstracts the worldwide engineering literature encompassing all engineering disciplines as well as related fields in science and management.

Fields of engineering include civil, water and waste, fuel, bioengineering, geology and mining, petroleum, metallurgical, mechanical, industrial, aerospace, marine, electrical and electronics, communications, control, and chemical. Related fields include construction materials, properties and testing of materials, transportation, pollution, ocean and underwater technology, nuclear technology, fluid flow, applied physics, heat and thermodynamics, computers, light and optical technology, sound and acoustical technology, instrumentation, and measurements. Premier engineering database.

COMPENDEX PLUS covers the journal literature, conference proceedings, books, and dissertations but patents are excluded. COMPENDEX PLUS contains over 1.8 million abstracted items with over 4500 primary sources monitored annually and 12,000 items added each month. Approximately 70% of the items are in English.

COMPENDEX PLUS database coverage varies depending on the online databank. Dialog, ORBIT, and STN coverage goes back to 1970. Dialog Knowledge Index coverage goes back to 1975. BRS and Data-Star coverage goes back to 1976. On Dialog, Orbit, and Data-Star databanks, the COMPENDEX PLUS database is more comprehensive and includes conference proceedings. On STN and BRS databanks, the COMPENDEX database is smaller and excludes the conference proceedings. COMPENDEX is not available on BRS AfterDark.

Depending on the databank, connect-time cost ranges from \$1.67/minute to \$2.00/minute (including telecommunication cost) and citation charges range from \$0.35 each to \$0.46 each. The least expensive access to COMPENDEX is through Dialog's Knowledge Index, the reduced-rate after-hours databank. On Knowledge Index, COMPENDEX costs \$0.40 per minute connect-time with no citation charges. Note that



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COMPENDEX is not available on BRS' After Dark, the other reduced-rate after-hours databank. As you can see, after-hours rates are extremely low and are the way to go for do-it-yourself searchers.

#### GEOREF DATABASE

Produced by the American Geological Institute, the GEOREF database is the premier database for the worldwide geology and geophysics literature including marine geology. A wide range of literature is indexed including books, journal articles, conferences, maps, dissertations, government documents and survey reports. No abstracts are available for items being indexed. Covering over 1.4 million citations back to 1785, GEOREF annually scans over 8000 journals with over 7000 items added monthly. Approximately 70% of the items are in English.

GEOREF is available on Dialog, Orbit, and STN. There is no reduced-rate after-hours access to GEOREF. Approximate costs are \$1.65/minute connect-time (including telecommunication cost) with citations costing \$0.40 each.

#### AQUATIC SCIENCES & FISHERIES ABSTRACTS

Produced by Cambridge Scientific Abstracts, the AQUATIC SCIENCES & FISHERIES ABSTRACTS database corresponds to the printed index of the same title from 1978 to present. AQUATIC SCIENCES & FISHERIES ABSTRACTS provides multidisciplinary access to marine and freshwater literature worldwide; approximately 5000 source items are monitored yearly for inclusion in the database. AQUATIC SCIENCES & FISHERIES ABSTRACTS database is the premier database for physical oceanography and fisheries. For other oceanographic disciplines including marine technology, AQUATIC SCIENCES & FISHERIES ABSTRACTS provides coverage but its coverage is not reliable or comprehensive. For other oceanographic disciplines, other databases have to be checked eg BIOSIS for biological oceanography. For marine technology INSPEC and COMPENDEX are good sources and complement the coverage of marine technology in AQUATIC SCIENCES & FISHERIES ABSTRACTS. AQUATIC SCIENCES & FISHERIES ABSTRACTS database is always worth a look (if available) but do not rely on it exclusively for marine technology information.

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AQUATIC SCIENCES & FISHERIES ABSTRACTS is available on Dialog and on BRS and BRS AfterDark as the CSAL database. Dialog charges \$1.70/minute (including telecommunication cost) and \$0.90/citation with BRS costing less. BRS AfterDark charges \$0.45/minute (including telecommunication cost) and \$0.38/citation. Obviously BRS AfterDark's reduced-rate after-hours access is the way to go for inexpensive access to this database.

#### AEROSPACE DATABASE

Produced by the American Institute of Aeronautics and Astronautics and NASA, the AEROSPACE database contains over 1.5 million abstracts to the worldwide literature on research and development in aerospace and related areas including strong coverage of satellite remote sensing. Sources includes books, journal articles, conference proceedings, patents, technical reports, and dissertations. Coverage extends back to 1962 with 2800 items added to the database each month.

The AEROSPACE is available on Dialog and on Dialog Knowledge Index. Dialog charges \$1.65/minute (including cost of telecommunication) and \$0.40/citation. Dialog Knowledge Index charges \$0.40/minute (including telecommunication cost) with no citation charge. Obviously Dialog Knowledge Index's reduced-rate after-hours access is the way to go for inexpensive access to this database.

#### OTHER DATABASES OF INTEREST

METEOROLOGICAL & GEOASTROPHYSICAL ABSTRACTS database, produced by the American Meteorological Institute, is the premier database for meteorology and climatology. Though it is very tardy in abstracting the literature, there is no other comparable database. Coverage of geophysics is not as strong as the coverage in the GEOREF database. Covering over 127,000 items back to 1972, METEOROLOGICAL & GEOASTROPHYSICAL ABSTRACTS annually scans over 200 sources including journals, proceedings, books, and annual publications. METEOROLOGICAL & GEOASTROPHYSICAL ABSTRACTS is only available on Dialog. There is no reduced-rate after-hours access. Costs are \$1.78 per minute connect-time (including telecommunication cost) with citations available for free.

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SCISEARCH database, produced by the Institute for Scientific Information, corresponds to SCIENCE CITATION INDEX. Coverage dates back to 1974; over 10 million new citations are added to the database yearly. SCISEARCH is best used for its citation indexing; you can use it to identify articles citing an earlier work. Citation searching will bring one good journal article reference up to date by locating subsequent articles citing that original article. SCISEARCH covers only the top 3300 journals in science (biology, chemistry, geology, physics, engineering, etc) and you will only find out those articles in those top journals that cited an earlier article. You will not find all articles that cited an earlier article.

Do not rely on the SCISEARCH database for author- or subject-oriented searches of the engineering literature; check other databases like INSPEC and COMPENDEX PLUS. SCISEARCH is available on Dialog, Orbit, and STN databanks. Costs are approximately \$2.85/minute (including telecommunication cost) and \$0.62/citation. A computer and mathematics subset of SCISEARCH (entitled COMPUTER & MATHEMATICS SEARCH) is available on BRS AfterDark for \$0.55/minute (including telecommunication cost) and \$0.29/citation. Dialog Knowledge Index does not offer SCISEARCH.

FLUIDEX database is produced by the British Hydromechanics Research Association and abstracts the worldwide literature relating to fluids in engineering. FLUIDEX covers fluid mechanics and dynamics, technology of ports and harbors, flow measurement, river and flood control, mixing and separation, fluid power and control, pumping and pipeline technology, dredging, civil engineering hydraulics, fluid sealing, and offshore engineering. FLUIDEX monitors over 1000 journals each year and also abstracts books, conference proceedings, technical reports, standards, and dissertations. FLUIDEX has over 200,000 references dating back to 1974; about 1500 items are added to the database each month. FLUIDEX is available on Dialog for \$1.35/minute (including telecommunication cost) and \$0.18/citation.

ISMEC database is produced by Cambridge Scientific Abstracts and abstracts the worldwide literature in mechanical engineering, production engineering, and engineering management. ISMEC also covers energy and power, mechanics, materials and devices, measurement and control, production processes, tools and equipment, and transport and handling.

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ISMEC coverage extends back to 1973 with 800 items added to the database each month. ISMEC is available on Dialog for \$1.70/minute (including telecommunication cost) and \$0.75/citation. ISMEC is also available on BRS and BRS AfterDark as file CSEN. BRS rates are \$1.21/minute (including telecommunication cost) and \$0.50/citation. BRS AfterDark's rate is \$0.45/minute (including telecommunication cost) and \$0.38/citation. Obviously BRS AfterDark offers the least expensive access to ISMEC.

#### MORE AND MORE AND MORE

A wide range of interesting databases are available. DOE ENERGY on Dialog and STN is produced by the US Department of Energy to abstract the energy literature. PASCAL on Dialog is a multidisciplinary scientific database produced in France; it is oftentimes worth a look for its strong coverage of the European scientific literature. SOVIET SCIENCE & TECHNOLOGY on Dialog provides access to the earth, engineering, environmental, and physical science literature of USSR. SPIN abstracts the physics and geophysics journals of the American Institute of Physics.

For a complete look at the science and technology databases available, look at a guide to the scientific literature or a database directory (both mentioned above).

#### TECHNICAL REPORTS & NTIS

Everyone knows that the technical report literature is considered gray literature meaning that technical reports are hard to find out about and hard to obtain. Coverage of technical reports can be weak or poor in many databases (and their corresponding printed indexes). In looking for published information, one looks in appropriate databases or indexes within the field of interest; for example, an electrical engineer should look in engineering databases like INSPEC and COMPENDEX. In checking those databases, some references to technical reports will be retrieved. However one database that is an important source of scientific and engineering technical report information is seldom checked: the NTIS database.

NTIS

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The National Technical Information Service (NTIS) is a US government-sponsored clearinghouse for the report literature resulting from unclassified government-sponsored contract research and also collects reports resulting from foreign government-sponsored R&D and engineering activities. Regarding NTIS' acquisition of US reports, the critical distinction is "contract" research; grant-funded academic research is not covered by NTIS and is reported in research journals covered by databases like INSPEC and COMPENDEX. Regarding NTIS' acquisition of foreign reports, NTIS annually collects reports from more than 15,000 foreign government-sponsored research and engineering programs from countries like Japan, west Germany, France, and Great Britain.

#### ACQUIRING NTIS REPORTS

Not only does NTIS acquire reports and informs the public of their availability, NTIS runs a document delivery service for those reports. Paper or microfiche copies of NTIS reports can be ordered by telephone, mail, fax, or electronically through an online databank. Orders are placed using the NTIS order number noted in the NTIS database record for an item. Paper copy prices typically range from \$16 through \$50; microfiche copy prices typically are \$7 to \$11. Turnaround time on shipping reports is within 2 - 8 days of receipt of request; rush service is available. One-day turnaround rush service is available for a fee of \$12 in addition to copy price; express overnight delivery is available for a fee of \$22 in addition to copy price. Costs can be charged against credit card, check or money order, deposit account, or billing statement.

#### NTIS PRINTED PRODUCTS

NTIS publishes a biweekly index entitled GOVERNMENT REPORTS ANNOUNCEMENTS AND INDEX which summarizes all reports added to NTIS' collection. Costing \$420 for 24 issues and \$945 for the issues plus the annual index, GOVERNMENT REPORTS ANNOUNCEMENTS AND INDEX takes up a lot of space and is unwieldy to use. Subset products are handier to use for monitoring the report literature that NTIS collects. Weekly abstract newsletters are published on a variety of topics at reasonable prices including OCEAN TECHNOLOGY & ENGINEERING (described in "Printed Current Awareness Services" section; \$105); NATURAL RESOURCES & EARTH SCIENCES (\$105); COMPUTERS, CONTROL & INFORMATION THEORY (\$125); ELECTROTECHNOLOGY (\$95);

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GOVERNMENT INVENTIONS FOR LICENSING (\$225). NTIS also handles subscriptions to the US Department of Energy's OCEAN WAVE AND TIDAL ENERGY SYSTEMS bimonthly current awareness abstract newsletter (described in "Printed Current Awareness Services" section; \$90);

#### NTIS DATABASE

The NTIS database contains over 1.4 million abstracts to technical reports from US and non-US government-sponsored research, development, and engineering analyses. NTIS coverage is multidisciplinary and expands by over 5500 reports monthly. NTIS is available on online databanks (BRS Information Technologies, BRS AfterDark, Dialog Information Services, Dialog Knowledge Index, Data-Star, Orbit Search Service, STN) and on compact disk (Dialog Information Service, SilverPlatter). Coverage dates back to 1964 on all systems except BRS and BRS AfterDark which only go back to 1970. NTIS reports can be ordered from NTIS while online and searching the NTIS database; the databank passes your order request along to NTIS for fulfillment.

Depending on the databank, NTIS connect-time cost ranges from \$1.25/minute to \$1.55/minute (including telecommunication cost). Citation charges range from \$0.42 each to \$0.60 each. The least expensive access to NTIS is through reduced-rate after-hours online databanks like Dialog's Knowledge Index and BRS' After Dark. On Knowledge Index, NTIS costs \$0.40 per minute connect-time with no citation charges. On BRS' After Dark, NTIS costs \$0.17 per minute connect-time with citations costing \$0.03 each. As you can see, after-hours rates are extremely low and are the way to go for do-it-yourself searchers.

#### ONLINE CURRENT AWARENESS SERVICES

Monthly or periodic searches can be automatically run on almost any database on most databanks. These are useful to keep up-to-date with the latest references without having to consciously execute a database search each month. A preliminary search oriented to a specific database that will retrieve references on desired topic(s) is stored on the databank. When the databank updates the database, the stored searches are automatically executed to deliver search results through the mail or through the databank's electronic mail system. Called SDI (for selective dissemination of

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information) or ALERT, a basic fee is charged for each automatic search. Usually this fee is around \$10 - \$15 and covers 15-25 references; if more references are automatically retrieved, then the cost will increase accordingly.

CURRENT CONTENTS database from the Institute of Scientific Information is available online from Dialog, BRS, and BRS AfterDark. CURRENT CONTENTS specializes in speedy coverage of recent publications. CURRENT CONTENTS provides table of contents access to the 6500 leading journals in science, social science, arts, and humanities. 14,000 articles are added each week and only the most recent six months of journal articles are available in CURRENT CONTENTS database.

On Dialog, CURRENT CONTENTS costs \$1.90/minute (including telecommunication cost) and \$1.90 per table of contents; an individual citation costs about \$0.60. On BRS, CURRENT CONTENTS costs \$1.58/minute (including telecommunication cost) and \$1.01 per table of contents; an individual citation costs about \$0.50. On BRS AfterDark, CURRENT CONTENTS costs \$0.63/minute (including telecommunication cost) and \$0.89 per table of contents; an individual citation costs \$0.22. BRS AfterDark is the obvious choice for inexpensive access to CURRENT CONTENTS.

CURRENT CONTENTS is also available on floppy disk for the "Agriculture, Biology & Environmental Sciences" (900 journals) "Physical, Chemical & Earth Sciences" (800 journals), and "Engineering, Technology & Applied Science" sections (800 journals). Costing \$345 for an annual subscription, CURRENT CONTENTS is delivered on IBM, MAC, or NEC floppy disks. Also delivered on disk is search software to search, browse, and print the CURRENT CONTENTS references. Reprint request forms are included for printing directly from references from a CURRENT CONTENTS disk.

#### DATABASE SEARCHING

A wide range of bibliographic databases are loaded and available for searching on commercial databanks. The commercial databanks license the databases from their respective database producers and mount them on a system searchable with one command language. However each database is different in construction and the searcher should be aware how information is organized in each database of interest.

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You can do your own database searching. Whether you should choose to do it depends on your time and equipment, the expected frequency with which you will be searching, and particularly the cost of the database(s) of interest to you. If you expect to search databases regularly so that you remember how to do it and providing that the database(s) of interest are available for inexpensive access, then consider doing your own searching.

If the database(s) of interest are expensive, if the information is needed infrequently so that you will forget how to search, or, if the information needed is complex, then you may wish to rely on the services of an expert searcher.

#### REQUESTING A DATABASE SEARCH FROM AN EXPERT SEARCHER

Request to be present when the search is executed; you have a stake in the information retrieved. As part of the search process, you can preview some of the citations that are being retrieved. This ensures relevance to your information needs. While previewing these in-progress results, you may wish to modify the search in order to sharpen the focus of the citations being retrieved and/or decrease the number of citations retrieved in order to reduce final costs. When you are present, the search results are delivered as if you did the search. You can control the progress and results of the search.

#### DO YOUR OWN DATABASE SEARCHING

**BASIC EQUIPMENT NEEDS:** To search online databases, you need to telecommunicate over telephone lines via modem. Calls are made to local telephone numbers switching you through special networks (ie Telenet, Tymnet) to the online databank. The modem can be any brand and must follow industry standards: CCITT V.22BIS for 2400 baud, Bell 212A for 1200 baud, and Bell 103 for 300 baud. You must use telecommunications software that makes your computer act like a terminal, that has asynchronous transmission, and that communicates in ASCII code. A BREAK or INTERRUPT function is very useful as well as DOWNLOAD and PRINT. Telecommunication protocol is usually 1 start bit, 7 data bits, even parity, one stop bit, OR, 1 start bit, 8 data bits, no parity, one stop bit. XON/XOFF is on; Auto line feed is off; ABM/answerback is off; block mode is off; Auto disconnect is off.



## REDUCED-RATE DATABANKS

The bottom line on database searching is "how much is it going to cost?". Databanks can be broken down into two categories --1) those offering significant savings in cost, and 2) everything else. Cost is the major issue to scientists considering searching for themselves. Database searching can be extremely expensive when searched at the full rate charged by databanks. The connect-time and citation-charge pricing scheme particularly penalizes less experienced searchers; experience helps in being quick and avoiding unnecessary citations. Since databank search accounts are saturated in the library market and in order to increase revenues, two databanks, Dialog's Knowledge Index and BRS AfterDark, provide access to selected databases for individuals at rates below the market value of the information. Because of the substantial discount involved, you should definitely consider doing your own database searching if reduced-rate access is available for your database(s) of interest.

## DIALOG KNOWLEDGE INDEX

Available worldwide, KNOWLEDGE INDEX is a reduced-rate after-hours service for searching selected databases loaded on the Dialog databank. KNOWLEDGE INDEX offers INSPEC, COMPENDEX PLUS, NTIS, AEROSPACE, MATHSCI, BOOKS IN PRINT, ABI/INFORM (for business information), GPO (US government agency publications published by the US Government Printing Office), DISSERTATION ABSTRACTS, and other databases. Current database offerings number almost 80.

KNOWLEDGE INDEX is available after 6 PM local time on weekdays and during most weekend hours. There is a \$35 startup fee and a connect-time rate of \$0.40 per minute for any database. Two free hours of connect-time are given upon signup to be used within the first 30 days; this represents a \$48 value and more than offsets the signup fee. KNOWLEDGE INDEX has no separate charges for telecommunications or citations. REPEAT: THERE ARE NO CITATION CHARGES!!! The lack of citation charges is significant; you only have to worry about connect-time charges at \$0.40 per minute. You do not have to religiously monitor the number of citations you download/print except as they impact connect-time. KNOWLEDGE INDEX is a "pay as you go" service with no monthly minimum; this is a decided advantage for low-volume searchers.

KNOWLEDGE INDEX does not offer access to BIOSIS/Biological Abstracts, CURRENT CONTENTS, SCISEARCH/Science Citation Index, ISMEC, AQUATIC SCIENCES & FISHERIES ABSTRACTS, METEOROLOGICAL & GEOASTROPHYSICAL ABSTRACTS, or GEOREF. If you need access to a wider range of databases than KNOWLEDGE INDEX offers, then you need an account on a regular full-rate databank. Since full-rate searching penalizes the inexperienced, you may wish to leave this to an experienced searcher. KNOWLEDGE INDEX is an incredible deal for marine engineers since it offers INSPEC, COMPENDEX, and NTIS which are the major databases for the engineering literature.

KNOWLEDGE INDEX users can order items retrieved from their search of KNOWLEDGE INDEX databases. Full text articles can be ordered online from KNOWLEDGE INDEX with the items mailed directly to the requestor and charges billed to the KNOWLEDGE INDEX account. Currently photocopies of articles ordered via KNOWLEDGE INDEX cost \$7.50 plus \$0.35/page photocopied. Actual documents cost \$10 plus cost of document. Rush orders have an additional surcharge of \$7.50.

#### BRS AFTERDARK

BRS AFTERDARK is a reduced-rate after-hours service for searching most of the databases loaded on the BRS databank. BRS AFTERDARK offers INSPEC, NTIS, CURRENT CONTENTS, AQUATIC SCIENCES & FISHERIES ABSTRACTS (as file CSAL), FAIRBASE (upcoming meetings), MATHSCI, BOOKS IN PRINT, ABI/INFORM (for business information), GPO (US government agency publications published by the US Government Printing Office), DISSERTATION ABSTRACTS, and other databases. Current database offerings number over 80.

BRS AFTERDARK has a signup fee of \$75 and has a minimum monthly commitment of \$12 which is applied toward monthly usage. BRS AFTERDARK's \$12 minimum monthly commitment directly contrasts KNOWLEDGE INDEX's lack of monthly commitment. A monthly minimum charge is inappropriate for infrequent searchers because, for some months of the year, they may not incur search costs greater than the monthly minimum.

BRS AFTERDARK has lower connect-time rates than KNOWLEDGE INDEX but these lower connect-time rates are offset by the seemingly nominal citation charges imposed by BRS AFTERDARK. KNOWLEDGE INDEX does not have citation charges. Using INSPEC

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as an example, BRS AFTERDARK charges \$21/hour and \$0.06/citation. KNOWLEDGE INDEX charges \$24/hour and has no citation charges. A 30 minute INSPEC search yielding 100 citations would cost \$16 on BRS AFTERDARK and \$12 on KNOWLEDGE INDEX. Download/print more than 100 citations in that 1/2 hour and the cost differential increases.

Because of the minimum monthly charge and the citation charges, BRS AFTERDARK should only be considered for searching databases not available through KNOWLEDGE INDEX. BIOSIS/Biological Abstracts, ZOOLOGICAL RECORD, ISMEC (known as file CSEN), CURRENT CONTENTS, AQUATIC SCIENCES & FISHERIES ABSTRACTS (as file CSAL), FAIRBASE, the computer and mathematics subset of SCISEARCH known as COMPUTER & MATHEMATICS SEARCH, NEDRES (NOAA's guide to environmental datasets), PATDATA (US patents since 1971), and CHEMICAL ABSTRACTS are some of them.

BRS AFTERDARK does not offer access to COMPENDEX PLUS (the premier engineering database), AEROSPACE (the premier aerospace and remote sensing database), the complete SCISEARCH/Science Citation Index, METEOROLOGICAL & GEOASTROPHYSICAL ABSTRACTS, or GEOREF. If you need access to a wider range of databases than BRS AFTERDARK or KNOWLEDGE INDEX offers, then you need an account on a regular full-rate databank. Since full-rate searching penalizes the inexperienced, you may wish to leave this to an experienced searcher. While BRS AFTERDARK has some advantages, KNOWLEDGE INDEX is probably the best deal for most marine engineers since it offers INSPEC, COMPENDEX, and NTIS which are the major databases for the engineering literature.

IF YOU GO SOLO, ASK FOR ASSISTANCE WHEN NEEDED

Database searching can have complexity and nuance beyond the use of keywords to find information on a subject. Have a reasonable expectation of search results if you are doing your own searching. Some databases use controlled vocabularies, called thesauri, to subject-index references; other databases use numerical coding to subject-index references. Awareness of the structure of specific databases and their indexing schemes is essential when attempting a comprehensive database search of the literature.

Trying to be comprehensive in retrieval can be difficult for the less experience. You can get usually great search results but do not expect comprehensive retrieval without

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knowledge and utilization of the structure and content of a particular database's records. Databanks may provide menu-driven search systems to make the mechanics of searching easier but the databases themselves are not made easier. On the other hand, comprehensive retrieval is infrequently needed; some but not all pertinent references do suffice for most needs.

If you feel you are not retrieving enough references on a particular topic, contact the database producer; they usually offer search assistance. You can also contact an expert searcher or reference librarian for advice.

#### DATABASE SEARCH TIPS

Online systems usually charge based on connect-time and output with the output being the citations being downloaded/printed. The objective of cost-effective searching is to minimize connect-time and the citations being downloaded/printed. Even if there are no citation charges, connect-time is running while downloading/printing unnecessary citations. Lots of unnecessary charges will be assessed if the searcher does not constantly keep in mind that THE CLOCK IS RUNNING and WHAT YOU SEE IS WHAT YOU PAY FOR.

#### MINIMIZING CONNECT TIME:

Connect-time charges can be reduced two ways: minimize the actual time spent online and/or use less expensive connect-time. Online connect-time can be minimized by searching at baud rates higher than 1200 and by planning ahead. Purchase a 2400 baud modem; they are inexpensive and do not cost much more than a 1200 baud modem. For example, the Practical Peripheral 2400 baud internal modem costs less than \$150. 9600 baud modem access is not supported by databanks.

Less expensive connect-time can be found by databank shopping. Obviously the best deal is the reduced-rate after-hours databanks (Dialog Knowledge Index, BRS AfterDark) providing they have the database(s) of primary interest. If you are considering access to full-rate 24-hour databanks due to the range of databases available, you need to shop around. Request current database price lists from several databanks before signing up with one service. Connect-time prices and citation charges vary. One databank can offer substantially lower connect-time cost on a particular database compared to

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another databank. For example, BRS tends to offer less expensive connect-time than Dialog. Data-Star offers the best connect-time rates due to a \$20/hour connect-time discount for searches executed between 10am-10pm PST, 11am-11pm MST, Noon-Midnight CST, and 1pm-1am EST. This is off-peak time for the Data-Star mainframe in Switzerland; however accessing Data-Star is a local phone call to telecommunication trunk lines. In addition to connect-time cost differential, citation charges for the same database can vary on databanks by up to \$0.10 - \$0.20. This translates into a difference of \$10 - \$20 for every 100 citations.

PLAN AHEAD: Decide what to do before logging onto the system. Do not logon and then think about how to search for a topic; you will be paying money for every minute you think. The objective is to logon, execute a search, and logout as quickly as possible. Write a search plan out on paper. The search plan will list subject keywords to be searched and combined, range of publication years desired, language limitation (eg English only), authors' names if appropriate.

#### SEARCHING ON WORDS AND PHRASES:

Each databank has logical operators used to link for works, eg AND, OR, NOT. In addition, adjacency operators are used to search for phrases. Always search a phrase like "conductivity-temperature-depth" as a phrase in order to narrow down on the number of citations retrieved. On the other hand, do not strictly search words as phrases if the order of words may be rearranged in various citations, eg "stress measurement" and "measurement of stress".

#### VARIATION IN TERMINOLOGY:

Subject searches are executed using keywords or phrases reflecting the range of terminology used by the universe of authors writing on a particular topic. In searching for references, it is critical to think broadly about the variation in wording that authors use to discuss a topic. Think about the words one may see in the title and abstracts of articles of interest. Usually one concept can be worded several different ways; for example, the concept of "measurement" may be also located by using the words "sensing", "sensor", "instrument", "instrumentation", "detection", etc. Search "CTD" as well as "conductivity-temperature-depth".

#### TRUNCATION OF STEM WORDS:

It is especially important to search on truncated stem or root words in order to retrieve variant endings of interest. For example, search on the truncated stem word "measur" rather than the word "measurement" in order to retrieve the words "measure", "measuring", "measurement", "measurements".

#### VARIATION IN AUTHOR'S NAME:

Never assume that a database includes an author's full first name, first initial instead of full name, or middle initial. Never assume how a database lists an author's name! There may or may not be a comma after the last name and before the first initial or first name. There may or may not be periods and spaces after initials. Databases vary considerably in handling author's names though an individual database is usually consistent within itself. Look at a few sample references to see how authors' names are handled or refer to database documentation.

#### FREE-TEXT WORDS/PHRASES & INDEX KEYWORDS/PHRASES:

Comprehensive searches utilize words and phrases that you know to be relevant from your knowledge of the topic and also gleaned from titles and abstracts of any references and articles in your possession. It is also important to incorporate index terms and phrases added to the database by the database producer. Most databases have their references indexed with a controlled list of keywords and phrases. These controlled lists may be referred to as subject headings, descriptors, index terms, thesaurus, controlled vocabulary, etc. The existence of a controlled list of keywords and phrases is important and should not be ignored when executing comprehensive searches on a topic. However, when executing quick-and-dirty searches for a handful of relevant references, one can ignore keywords and phrases in a controlled list.

A database producer generally adds keywords or phrases from a controlled list in order to bring consistent indexing to all articles on one topic no matter what description authors may use in titles and abstracts of articles. Thus a comprehensive search that is intended to thoroughly retrieve

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the literature should incorporate keywords and phrases from the database's controlled list as well as free-text keywords and phrases used by authors in titles and abstracts of relevant articles.

Almost all database producers publish and sell their list of controlled keywords and phrases. While it is handy to have a copy of the controlled keyword list handy for referral, one can examine the full record of relevant references retrieved from a database and ascertain those controlled keywords and phrases. Follow this stratagem:

- 1) Logon and do a quick search by title keywords to find about 5 relevant references on the topic.
- 2) Download/print the full, long record for those 5 relevant references. The full, long records will include the keyword indexing from the controlled list as well as the author, title, journal reference, and abstract (if available).
- 3) Logoff to stop the clock.
- 4) While offline, look at the full records and check for controlled keywords or phrases used by the database producer in indexing the references. The controlled keywords and phrases will usually be listed in a separate record field. In addition, look for additional terminology in the titles and abstracts of the references retrieved. The best, most comprehensive search will use controlled keywords/phrases and free text from titles and abstracts.
- 5) Logon a 2nd time; execute a search using words & phrases,
  - 1) that you know to be relevant from your knowledge of the topic,
  - 2) gleaned from titles and abstracts of references and any articles already in your possession,
  - 3) identified during the preliminary search as index terms from the database producer's controlled list.

#### MINIMIZING CITATION CHARGES:

With the retrieval of a relatively small amount of citations, citation charges are not an overwhelming component of the total search cost. However, with large citation retrievals,

citation charges and the connect-time necessary to print them will be the major component of search cost. Examining a large retrieval in order to figure out a way to reduce it consumes connect-time to examine results; more connect-time is consumed executing additional search steps that may or may not offer significant reduction. Thus reduction of large retrievals can become counterproductive in many cases; the searcher has to spend money on connect-time in order to save money on citation charges. In addition, the deleted citations may contain some citations of interest.

The objective is to download/print only those citations of interest. Citations cost money in connect-time and/or citation charges. A charge may be assessed for each citation viewed (citations consist of author, title, journal reference). Abstracts are usually not assessed an additional charge but do cost considerably more. The amount of text in an abstract is equal to the display of several citations; therefore one abstract can consume the connect-time equal to several citations. Abstracts are great but take them only if you are willing to pay the connect-time premium for them.

Viewing only the titles of the citations consumes minimal connect-time and sidesteps citation charges. Thus title-scanning for citations of interest is an effective stratagem to reduce retrieval. Searches usually yield relevant citations mixed with irrelevant citations. To be avoided is viewing the author, title, and journal reference for large numbers of irrelevant citations; THIS COSTS MONEY IN CONNECT TIME AND/OR CITATION CHARGES. Do not download/print complete citations with abstracts for everything retrieved. Lots of connect-time will be consumed and citation charges (if applicable) will result in money spent needlessly on irrelevant citations. In order to reduce the retrieval down to only those citations desired, follow this stratagem.

- 1) Logon the system and execute a search using keywords or authors' names to retrieve a set of citations.
- 2) Download/print only the titles of those citations retrieved. Do not get the complete citations for all citations retrieved unless they are actually needed.
- 3) Save the search strategy or answer set on the online databank, or, simply document the search steps used to arrive at the set of citations.
- 4) Logoff to stop the clock assessing connect-time charges.



- 5) While offline, review the downloaded/printed list of titles and note those titles of interest.
- 6) Logon the system a second time and rerun the search to recover the set of citations.
- 7) Download/print the complete citations corresponding to the titles of interest.

#### COMPACT DISK DATABASES

In the last five years, bibliographic database producers have started marketing their databases directly to the users on compact disk thus bypassing the online databank middleman. On an online databank, the costs are split between the database producer and the databank offering the database for searching. With a compact disk database, the costs go directly to the database producer. For heavy users of a particular database, compact disk databases are good news. Compact disk database subscriptions are a fixed cost that can be budgeted. The search costs associated with usage of one database on an online databank are accrued on a pay-as-you-go basis and cannot be budgeted reliably. Infrequent users of a particular database or those interested in accessing a wide range of databases are well served by the wide range of databases offered by online databanks.

#### COMPENDEX PLUS COMPACT DISK

Produced by Dialog, COMPENDEX PLUS compact disk corresponds to the COMPENDEX PLUS database from Engineering Information. COMPENDEX PLUS abstracts the worldwide engineering literature encompassing all engineering disciplines. Engineering fields covered include: civil, energy, environmental, geological, electrical, control, mechanical, aerospace, robotics, etc. Premier engineering database. COMPENDEX PLUS covers the journals, conference proceedings, books, and dissertations; patents are excluded.

COMPENDEX PLUS compact disk will eventually become part of an Engineering Information workstation available from Engineering Information. The Engineering Information Workstation will combine the compact disk database, document ordering, and document delivery using document images and

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also fax direct from Engineering Information in New York City.

The compact disk version of COMPENDEX PLUS does not extend back to 1970 as the online database does. Currently, COMPENDEX PLUS compact disk costs \$3450 for the current year and the previous year. For the current year and the four previous years, the cost is \$4920.

#### AQUATIC SCIENCES & FISHERIES ABSTRACTS COMPACT DISK

Produced by Cambridge Scientific Abstracts and available from Udata, AQUATIC SCIENCES & FISHERIES ABSTRACTS corresponds to the printed index of the same title from 1982 to present. AQUATIC SCIENCES & FISHERIES ABSTRACTS compact disk provides multidisciplinary access to marine and freshwater literature worldwide; approximately 5000 source items are monitored yearly for inclusion in the database. AQUATIC SCIENCES & FISHERIES ABSTRACTS compact disk is the premier database on physical oceanography and fisheries.

For other oceanographic disciplines including marine technology, AQUATIC SCIENCES & FISHERIES ABSTRACTS compact disk is extremely useful but its coverage is not reliable or comprehensive. Other databases have to be checked; for marine technology, INSPEC and COMPENDEX are good sources of information and complement the coverage of marine technology in AQUATIC SCIENCES & FISHERIES ABSTRACTS. AQUATIC SCIENCES & FISHERIES ABSTRACTS compact disk is worth a look (if available) but do not rely on it exclusively for marine technology information. Currently a subscription to the years since 1987 costs \$2250; the backfile for the years 1982-1986 costs \$2500 as a one-time fee.

#### SCIENCE CITATION INDEX COMPACT DISK

Produced by the Institute for Scientific Information, SCIENCE CITATION INDEX compact disk covers the top 3300 journals in science (biology, chemistry, geology, physics, engineering, etc). SCIENCE CITATION INDEX compact disk corresponds to the SCISEARCH database; however compact disk coverage only extends back to 1986 (versus 1974 for the online SCISEARCH). In-depth coverage of any discipline is best found in the comprehensive database or compact disk for that discipline eg COMPENDEX database and compact disk for engineering. SCIENCE CITATION INDEX compact disk costs \$2550

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for 1986, \$7650 for 1987, \$10200 for each year after 1988 starting with 1988. The disks are purchased and not leased on subscription. Discounts are available for those purchasing multiple years and for subscribers to the printed SCIENCE CITATION INDEX.

#### OTHER COMPACT DISK DATABASES

NTIS compact disk offers excellent coverage of reports resulting from US and foreign government sponsored research and development. The NTIS database is described more fully above. NTIS compact disk is available from Dialog and SilverPlatter; an annual subscription costs: \$2250 from SilverPlatter for 1983 to present, \$2350 from Dialog for 1985 to present, \$3600 from Dialog for 1980 to present.

ARCTIC & ANTARCTIC REGIONS compact disk (produced by the US Army Corps of Engineers Cold Regions Research and Engineering Laboratory and the National Science Foundation Division of Polar Programs and available from UPDATA) provides coverage of the multidisciplinary Antarctic literature back to 1962. Arctic civil engineering and ice/snow literature is covered back to 1951; Arctic coverage is not multidisciplinary. The free current-awareness newsletter entitled CURRENT ANTARCTIC LITERATURE corresponds to the Antarctic information being added to the ARCTIC & ANTARCTIC REGIONS compact disk. Anyone interested in cold region engineering would be strongly interested in the ARCTIC & ANTARCTIC REGIONS compact disk; annual subscription cost is \$595. The compact disk corresponds to the COLD database on Orbit.

MATHSCI compact disk is available from SilverPlatter and produced from the American Mathematical Society's MATHSCI database. MATHSCI compact disk corresponds to Mathematical Reviews and Current Mathematical Publications from January 1985 to June 1989. MATHSCI compact disk database includes references to mathematical aspects of geophysics, geology, and oceanography. MATHSCI compact disk runs on a Macintosh and a subscription costs \$3791.

#### NON-BIBLIOGRAPHIC COMPACT DISKS

Non-bibliographic compact disk databases are appearing. Compact disks are an inexpensive means to distribute datasets widely. NODC has made available the Pacific Ocean

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Temperature and Salinity Data from 1900-1988 on compact disk. NODS/JPL has issues CZCS ocean color data on compact disk. NGDC has issued compact disks for the Deep Sea Drilling Project sedimentary and hardrock data; a Geophysics of North America compact disk covers geology, bathymetry, topography, seismicity, and geomagnetic data. GLORIA side-scan sonar EEZ images are being released on compact disk.

#### COMPACT DISK PLAYERS

Missouri Library Network Corporation (MLNC) sells Hitachi compact disk players at an exceptional discount to educational institutions. The internal Hitachi 3600 player is available for \$575 and the external player version (the Hitachi 6000) is available for \$625. The external Hitachi 1503S player is available for \$590. Prices include cable, interface card and shipping. A Hitachi-only version of the Microsoft CDROM Extensions software is available for \$22. MLNC will fax a current price list upon request.

For non-educational institutions, reasonable prices for Hitachi can be obtained from Updata.

#### ACCESSING COMPACT DISKS ON A NETWORK

Compact disk databases can be accessed by one user at a time on a microcomputer with attached CDROM player, or, by multiple remote users when a microcomputer with attached CDROM player is connected to a local area network (LAN). When the CDROM database is connected to a LAN, several users can access the compact disk database simultaneously. Though compact disk players are not hot performers in accessing data (about as fast as an old IBM XT floppy disk drive), tests show that performance is not significantly degraded until there are over five to seven simultaneous users. With multiple users being able to access a CDROM database through a LAN, an expensive subscription to a CDROM database starts making better sense. However the high equipment costs and the compact disk subscription costs for networked access to a compact disk database has to be balanced against pay-as-you-go access to that same database on an online databank. Compact disk databases on a network make the most sense when there are a large number of users; a small number of users would probably be better off with accounts on an online databank in order to access databases.

Most LAN software will not recognize CDROM players connected to the network; CDROM networking software has been created to patch in this capability. Only LANTastic LAN software will recognize CDROM players. At those sites with no pre-existing LAN, LANTastic offers exceptional value because you get well-reviewed LAN software and CDROM networking capability at low cost. For LANs not running LANTastic, several CDROM networking products are available to assist the LAN software in recognizing CDROM players on the network. Once LAN software offers this capability itself (which it surely will), these CDROM networking products will lose major market share. CDROM networking software may or may not require a dedicated filesaver accessing the CDROM database. If a dedicated file server is not required, then an existing microcomputer on the LAN can do double duty by providing CDROM access to all other users on the LAN.

Several reviews have been published on CDROM networking solutions; the best reviews are the first two. Although a brief summary of the reviews is provided, read them before drawing any major conclusions. No blanket recommendation can be made except for LANTastic for those with no existing LAN. An appropriate selection depends on the LAN software being used and the RAM memory requirements of the CDROM database search software. Pay particular attention to the RAM memory requirements imposed on the individual workstation by the LAN software itself, the CDROM networking software, DOS, and the CDROM database software. CDROM database software usually requires a lot of RAM memory and there may not be enough to go around. Additionally, the usual CDROM licensing agreement and price presumes single-user access. Those considering multiuser access with concerns about being legally correct should approach the vendor regarding a multiuser licensing agreement and price.

(1) "Software Broadens Access to CD-ROM." PC Week 6:23, 28-29, 32. January 8, 1990.  
EVALUATED: Artisoft (LANTastic), CBIS (CD Connection), Online (Opti-Net)  
RESULTS (Weighted Score): OPTI-NET 9.6; CD Connection 8.8; LANTastic 6.4

(2) M. Keith Thompson and Kimberly Maxwell. "Building Workgroup Solutions: Networking CD-ROMs." PC Magazine 9(4):237-260, February 27, 1990.  
EVALUATED: Advanced Graphic Applications (AGANET), Artisoft (LANTastic), CBIS (CD Server), Fresh Technology

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Group (Map Assist), Hewlett-Packard (HP OfficeShare), and Online (Opti-Net)

RESULTS: Editor's Choice--CD Server and LANtastic.

- (3) Bradley Watson and Jon Fausey. "Relative Performance of Three CD-ROM Network Access Products." OCLC Micro 5:20-21, August 1989.

EVALUATED: Artisoft (LANtastic), Meridian (CD Net), and Online (Opti-Net).

RESULTS: "In general, the multi-user tests showed the highest retrieval rates for CD Net, with OPTI-NET a close second, and LANtastic a distant third." (p. 21)

#### THOMAS REGISTER & YELLOW PAGES

THOMAS REGISTER is the premier source of product information for North American manufacturing companies. THOMAS REGISTER provides company descriptions and product indexing on approximately 148,000 public and private manufacturers for the US and Canadian markets.

THOMAS REGISTER is available as a printed index, as the THOMAS REGISTER ONLINE database on Dialog, and on compact disk from Dialog. If you wish that you could access the information in THOMAS REGISTER differently, then the database and compact disk versions are of interest. You can search by trade/brand names, geographic location, SIC code, company names, products, etc; the THOMAS REGISTER database and compact disk can be used for market analysis, sales prospecting, competitive intelligence, or product research.

The THOMAS REGISTER ONLINE database on Dialog costs \$1.87 per minute (including telecommunication cost) and \$1.50 per company listing; mailing label output is available.

An annual subscription to THOMAS REGISTER compact disk costs \$1495. Cost of the printed THOMAS REGISTER is \$240.

D&B-DUN'S ELECTRONIC YELLOW PAGES provides directory information for approximately 9 million public and private US businesses. Business establishments covered are: agriculture, business services, communications, construction, finance, insurance, manufacturing, mining, professional services, real estate, retail sales, transportation, utilities, and wholesale sales. Address, telephone number, employee size, and SIC codes are listed. D&B-DUN'S ELECTRONIC YELLOW PAGES does not correspond to phone company

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yellow pages. Available on Dialog, cost is \$1.40/minute and \$0.30/listing; mailing label output is available.

## TRANSLATIONS

Occasionally one is interested in non-English journal articles and cannot read the language or find a friend to translate. The possibility always exists that a particular non-English journal article has been translated into English or some other language that you can read. There are two possibilities: the journal is available in English translation with each issue being translated complete, or, selected articles from the journal have been translated.

### COVER-TO-COVER TRANSLATIONS:

For certain major non-English journals, each issue is translated cover-to-cover and published under another journal title. For example, OCEANOLOGY is a cover-to-cover translation of the Russian journal OKEANOLOGIYA or OKEANOLOGIYA. If you have a reference to the Russian-titled journal, you would not know from looking at the reference or the Russian journal itself that each issue has been translated completely and is published under another title. Cover-to-cover translations of journal issues are listed in JOURNALS IN TRANSLATION (Boston Spa Wetherby, West Yorkshire, U.K. : British Library Document Supply Centre ; Delft, Netherlands : International Translations Centre, 1988). JOURNALS IN TRANSLATION lists those non-English journals currently being translated cover-to-cover and gives the title of the translation journal. These translated journals usually have a different title from the non-English journal, and, in most cases, you will never be aware of the availability of a translation because your reference will be to the non-English journal. Check JOURNALS IN TRANSLATION to be sure.

### INDIVIDUAL TRANSLATIONS:

If you have a reference to a significant non-English journal article (particularly Russian ones), then a translation of that individual article may be readily available. When you really need an article translated, it is prudent to check if it has already been translated rather than paying someone to translate it from scratch. The hit rate is low on finding an existing translation but, since paying for a fresh translation is expensive, it is worth a look. Translations

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of individual articles are listed under the name of the journal or the author in WORLD TRANSLATIONS INDEX (Delft, Netherlands : International Translations Centre). WORLD TRANSLATIONS INDEX merged two previous indexes entitled Translations Register-Index and World Transindex. WORLD TRANSLATIONS INDEX and its earlier titles list translations put on deposit at translation clearinghouses in the US and overseas. These translations are available for ordering. Prices vary depending on the individual clearinghouse's rates but they are less expensive than paying for an original translation.

WORLD TRANSLATIONS INDEX and its earlier titles span years back to the 1950s. Since an article may have been translated at any time from date of publication to present, the indexes should be checked for a span of years to present. Fortunately, for those doing a manual search, cumulative multiyear volumes are available for quickly looking up a journal article.

For those interested in researching translation availability through a database search, Dialog Information Services offers the WORLD TRANSLATIONS INDEX database. The WORLD TRANSLATIONS INDEX database covers 1977 to present and lists the availability of over 269,000 translations in science and technology. Translations into all Western languages are listed so it is possible to find the article of interest only translated into French. The WORLD TRANSLATIONS INDEX database costs \$1.80/minute (including telecommunication cost) and \$1.75 per citation to availability of a translation.

Obviously the database does not go back far enough for checking on the translation availability of journal articles published before 1977. For articles published before 1977, the pre-1977 years have to be checked in the printed index with the database filling in for coverage from 1977 to date.

#### TRANSLATION SERVICES:

Translation services are readily available and usually expensive; Asian languages are the most expensive. Individual translators and companies are listed in TRANSLATION AND TRANSLATORS (New York : Bowker, 1979) and TRANSLATION SERVICES DIRECTORY (Medford, NJ : Learned Information, 1986). Some translation companies are: AD-EX, American Geotran, American Translators International, Associated Technical Services, ELB Translation Services, ICOA



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Translations, Polyglot Language Service, and Ralph McElroy Translation Company. Rates are usually charged per 100 words ranging from \$7 - \$15 depending on the language and the company. Rush service is usually available for an additional fee.

#### FORTHCOMING MEETINGS

Two printed indexes are invaluable in determining upcoming scientific and technical meetings both in North America and worldwide. WORLD MEETINGS: UNITED STATES AND CANADA and WORLD MEETINGS: OUTSIDE UNITED STATES AND CANADA (New York: Macmillan for both titles) are used to determine the availability of upcoming meetings by subject, location, and date. With indexes providing access to upcoming meetings by location and date, WORLD MEETINGS can be used to shop for desirable meeting locations and/or desirable meeting dates. If you know where you want to go or when, you can check if a relevant meeting is available. This is a common stratagem for coordinating vacation travel with business travel in order to receive travel support to desirable destinations and/or receive a tax deduction for business travel associated with a vacation.

WORLD MEETINGS is not available for database searching but a competing product, FAIRBASE, is. The FAIRBASE database lists over 20,000 upcoming and past trade fairs, exhibitions, conferences, and meetings in over 100 countries. Dating from 1986 and into the next century, FAIRBASE covers past and future events in all sciences and industries. Information is given on the sponsoring organization, dates, location, registration fee, and exhibition details. FAIRBASE is available on BRS Information Technologies, BRS AfterDark, and Data-Star. Current BRS AfterDark cost is \$0.80/minute (including telecommunication cost) and \$0.78 per meeting record. Current BRS Information Technologies cost is \$2.00/minute (including telecommunication cost) and \$0.90 per meeting record.

#### PATENTS

Database searching for patents is a specialty unto itself. Patent titles and abstracts are worded in "patentese" and are not worded like titles and abstracts of scientific journal articles. Patent searching is the most expensive database searching. Considering cost and patentese, subject searching

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for patents can be dangerous business if comprehensive retrieval is mandatory for a patent review. It is far easier to search on company names to which patents are assigned or on personal names of inventors. If you need a subject-oriented review of patents, seek out an expert searcher (some listed below).

Patent databases are useful for corporate intelligence in tracking the patent position of competitors. US and worldwide patent databases are worth tracking even for US companies. Only granted US patents are published; US patent applications are not published and one does not know a competitor's patent applications until the patent is granted. Since US patents take up to 2 years to be granted, this delay in competitor information may be undesirable. In order to establish foreign protection for that US patent application, application(s) for foreign patent(s) has to be filed up to one year after filing for a US patent. Several foreign countries publish their patent applications; thus, a published foreign patent application is frequently the first report of a US company's patent activity.

The primary patent databases are:

CLAIMS (available on Dialog, Orbit, STN) is a series of databases for searching US patents granted back to 1950. Cost on Dialog is \$2.53/minute (includes telecommunication cost) and \$0.50/patent.

WORLD PATENTS INDEX (available on Dialog and Orbit) contains over 6 million patents issued by 30 major patent-issuing authorities. Coverage dates back to 1974 for all subjects and back further for chemical patents. Cost on Dialog is \$3.43/minute (includes telecommunication cost) and \$1.00/patent. The high cost is due to WORLD PATENTS INDEX's subject and chemical indexing scheme and availability of patent abstracts.

INPADOC (available on Dialog, Orbit, and STN) contains over 17 million patents issued by 55 patent-issuing authorities. Coverage dates back to 1969. Patent abstracts are not included. Cost on Dialog is \$2.28/minute (includes telecommunication cost) and \$20.00 (twenty dollars) per patent family. A patent family consists of the priority patent (first patent) and equivalent patents (subsequent patents filed to extend patent protection worldwide).

A wide range of patent databases are available; additional

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country-specific patent databases are available for the US (PATDATA on BRS and BRS AfterDark), Japan (JAPIO on Orbit), China, Canada, Germany, United Kingdom, etc.

#### EXPERT PATENT SEARCHING

Every large urban area has information brokers some of whom specialize in patent searching. Look in the yellow pages under "information brokers"; some are listed below. Information brokers are comprehensively listed in the DIRECTORY OF FEE-BASED INFORMATION SERVICES. Helen Burwell, ed. Burwell Enterprises, 3724 FM 1960, Suite 214, Houston TX 77068. (713)537-9051.

Savage Information Services  
2510 West 237th St Suite 200  
Torrance CA 90505  
(213)530-4747

Seek Information Service  
416 N Glendale Ave Suite M  
Glendale CA 91206  
(800)722-SEEK  
(818)242-2793  
fax (818)242-2876

Information On Demand  
2020 Milvia  
PO Box 9550  
Berkeley CA 94709  
(415)644-4500

#### DOCUMENT DELIVERY OF PATENTS

US patents can be obtained from a central public library in a large metropolitan area. For example, in California, these are San Diego Public Library, California State Library in Sacramento, and Sunnyvale Patent Information Clearinghouse (City of Sunnyvale). Photocopies of US patents are available through your local public library or through your institutional library; there may be a nominal fee.

A premier patent research company specializing in database searches, manual searches and speedy delivery of all patents, both US and foreign is Rapid Patent Service, PO Box 2527 Eads Station, 1921 Jefferson Davis Hwy Suite 1821-D, Arlington VA 22202. (800)336-5010. (703)920-5050. Fax (703)685-3987. Search Center: (703)521-8484.

#### STANDARDS AND SPECIFICATIONS

The terms "standards" and "specification" are frequently used interchangeable; both refer to detailed instructions about

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how something is to be manufactured, managed, designed, or handled. Specifications are usually limited to a certain application whereas standards are for more universal application and repetitive processes. Standards and specifications can be located in the following databases:

The IHS INTERNATIONAL STANDARDS AND SPECIFICATIONS database provides access to over 208,000 standards and specifications from over 470 standards organizations. Coverage of organizations includes the US government, US unclassified military, standards societies (eg ASTM, ANSI), US industry as well as international and foreign national standards organizations from Japan, France, Germany, China, United Kingdom, Canada, Australia, and Saudi Arabia. Standards and specifications on file date back to 1895. Produced by the Information Handling Services INC, the IHS INTERNATIONAL STANDARDS AND SPECIFICATIONS database is available on the Dialog for \$1.58/minute (including telecommunication cost) and \$0.35 per record retrieved.

The STANDARDS & SPECIFICATIONS database is compiled by the National Standards Association and provides access to over 118,000 international, US government, US private organizations (eg ASTM, ANSI), and US industry standards and specifications. Standards on file date back to 1920. STANDARDS & SPECIFICATIONS database is available on the Dialog Information Service. Current Dialog cost of the STANDARDS & SPECIFICATIONS database is \$1.60/minute (including telecommunication cost) and \$0.20 per record retrieved.

#### DOCUMENT DELIVERY OF STANDARDS AND SPECIFICATIONS

US and foreign standards and specifications are available from a variety of sources. Prices and turnaround time vary significantly so beware.

#### Global Engineering Documents

PO Box 19539  
2805 McGaw Ave  
Irvine CA 92714  
(714)261-1455  
(800)854-7179  
fax (714)261-7892

Document Engineering Co.  
15210 Staff St  
Van Nuys CA 91405  
(818)782-1010  
(213)873-5566

Global Engineering Documents  
7730 Carondelet Ave Suite 407

American Natl Standards Inst  
1430 Broadway

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Clayton MO 63105  
(314)726-0444  
(800)854-7179  
fax (314)726-6418

New York NY 10018  
(212)354-3300 (info)  
(212)642-4900 (order)

Global Engineering Documents  
1990 M St NW Suite 400  
Washington DC 20036  
(202)429-2860  
(800)854-7179  
fax (202)331-0960

National Standards Assn  
5161 River Road  
Bethesda MDS 20816  
(800)638-8094

### TRADEMARKS

Federal and state trademarks can be searched on two databases on the Dialog Information Service.

The TRADEMARKSCAN-FEDERAL database lists over 850,000 active registered and pending federal trademarks in the US Patent and Trademark Office. Active and pending trademarks date from 1884 with inactive trademarks dating from 1984. The database provides information on the product or service registered, the filing date for registration, the date of first use, and the owner. 40% of the records have the trademark image included. Special imaging software to view these trademark images is available from Dialog for IBM and Macintosh users. TRADEMARKSCAN-FEDERAL is designed for trademark searchers, art directors, attorneys, advertisers, etc who are trying to determine if any identical or similar marks are on file. Current Dialog cost of the TRADEMARKSCAN-FEDERAL database ranges from \$2.20-2.30/minute (including telecommunication cost) with registration records costing \$0.60 each and trademark images costing \$2.60 each.

The TRADEMARKSCAN-STATE database lists over 630,000 active commercial trademarks, excluding corporate names, registered with the offices of the Secretaries of State of the individual US states and Puerto Rico. Active state trademarks date from November 1986. The database provides information on the trademarked product or service, the registration date, and the owner. Current Dialog cost of the TRADEMARKSCAN-STATE database is \$2.28/minute (including telecommunication cost) with registration records costing \$0.60 each. State trademark images are not available.

INFORMATION BROKERS & DOCUMENT DELIVERY

If you want someone to do a search for you and/or obtain the documents for you, then you need an information broker. They are listed in the yellow pages under "information broker". Information brokers are comprehensively listed in the DIRECTORY OF FEE-BASED INFORMATION SERVICES. Helen Burwell, ed. Burwell Enterprises, 3724 FM 1960, Suite 214, Houston TX 77068. (713)537-9051.

With a broker, state your specific needs. If you require engineering information, ask whether the information broker handles engineering information. Many brokers specialize so you want to find a specialist for engineering information and document delivery. Prices range around a base fee of \$10-\$15.

Be sure to take advantage of interlibrary loan service at your institution's library or at a public library. For items not locally available, interlibrary loan (ILL) service obtains books and photocopies of journal articles from other libraries. ILL can be a free library service or fee-based; charges vary between \$2 to \$10 per item. Over 6000 North American libraries of all types are linked on an electronic interlibrary loan messaging network; therefore public libraries can easily borrow books and obtain journal article photocopies from academic libraries.

Databanks like Dialog, BRS, Orbit, and STN have online document ordering capability. While online, you can order documents that are referenced in your database searching.

KNOWLEDGE INDEX users can order items retrieved from their search of KNOWLEDGE INDEX databases. Full text articles can be ordered online from KNOWLEDGE INDEX with the items mailed directly to the requestor and charges billed to the KNOWLEDGE INDEX account. Currently photocopies of articles ordered via KNOWLEDGE INDEX cost \$7.50 plus \$0.35/page photocopied. Actual documents cost \$10 plus cost of document. Rush orders have an additional surcharge of \$7.50.

Some information brokers who will do database searches are listed in the "Patents" section above.

Some document delivery brokers are:

INFORMATION ON DEMAND  
8000 Westpark Dr  
McLean VA 22102

TRACOR JITCO ACQUIRE  
1601 Research Blvd  
Rockville MD 20850

(800)999-4463  
fax (703)442-0907  
only accepts deposit  
accounts & volume users

DYNAMIC INFORMATION  
333 Twin Dolphin Dr Ste 250  
Redwood City CA 94065  
(415)591-5900  
fax (415)595-3294

ENGINEERING SOCIETIES LIBRARY  
345 E 47 St  
New York NY 10017  
(212)705-7611  
fax (212)486-1086

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(301)984-2800

ENGINEERING INFORMATION  
DOCUMENT DELIVERY SERVICE  
345 E 47th St, Rm 204  
New York NY 10017  
(800)221-1044  
fax (212)832-1857

FIND/SVP  
500 Fifth Ave Ste 1130  
New York NY 10036  
(212)354-2424

#### BIBLIOGRAPHIC DATABASE SOFTWARE

Bibliographic database software is used to create and manage a personal database that can assist in the management of a reprint collection and track the relevant literature in a field of research. The bibliographic database software with the largest base of users are Reference Manager (for IBM and Macintosh) and Pro-Cite (for IBM and Macintosh); these are probably followed by EndNote (for Macintosh) and Notebook II (for IBM). A bibliographic database software is used to create, update, and search a database of literature references. You can search by author, date, title, abstract, and subject keywords. While any bibliographic database software can output a bibliography or list of references, a good bibliographic database software can build the bibliography by passing through the wordprocessed manuscript and scanning for in-text citations. Those software mentioned below can do this. After the manuscript is finished, the bibliographic database software scans it and replaces the in-text citations with a selected in-text citation style, for example (Armi 1989) or [7]. The bibliographic database software will then compile a bibliography corresponding to those in-text citations and format that bibliography according to preset bibliographic styles (eg Science, Nature) or your own individualized format(s). If a bibliographic database software cannot build a bibliography by scanning in-text citations within a manuscript, then it is not state-of-the-art in bibliographic database software.

The Macintosh versions of these bibliographic database software are the best because you can access your database without exiting your wordprocessing software and the manuscript in preparation. While wordprocessing, you can search your database and then insert in-text citations into the active manuscript. To do this on an IBM microcomputer requires add-on utilities for software switching (eg Switch-It, software Carousel) or multitasking (eg DesqView, Windows). The IBM version of Reference Manager does have an optional SPLICER utility for cut-and-paste between your wordprocessing software and your Reference Manager database.

A personal bibliographic database can be created by typing in the references by hand or, if you are lucky, by importing references directly from online or compact disk databases. Being able to import preexisting references is valuable because one can avoid typing those references and their abstracts into the database. However bibliographic database software vary widely in their import capability. Reference Manager and Pro-Cite both recognize specific pre-determined formats in the references being imported; those formats are seen in references from selected databases on online databanks. From a different approach, EndNote's import module entitled EndLink imports references using an algorithm interpreting the range of formats commonly seen from online databanks. EndNote's set of rules enables adaptation to a wide variety of reference formats but experimentation is necessary to ascertain if it will work with a particular reference format. For any of these bibliographic database software, the vendor can provide assistance in determining the software's capacity to import references from a target database. It is always best to check with the vendor regarding your particular import needs (particularly before purchase of the software if the successful importing from a target online database is mandatory).

Journal articles import best into bibliographic database software. References for non-journal articles may have to be monitored during or after import and then edited to ensure completeness. With some bibliographic database software, you can pause and view each reference being imported. You can scan a printout of the references being imported and then edit incomplete references during import in order to ensure that complete bibliographic references are created. If you cannot monitor each reference being imported, then you have to go through each reference after importing.

A retrospective search can be executed on an online database



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to provide a base of references on which you can build your own personal database. While this costs money for both connect time and citation charges, it may be more economic than the cost of keyboarding a database from scratch. The database search can deliver abstracts along with the references retrieved; abstracts are particularly useful and would be daunting to keyboard into a personal database by hand. After the retrospective search builds the backfile for the personal database, ongoing searches can be run periodically to update the personal database with the latest references. A preliminary search can be run on an online database of interest in order to determine in advance the number of references expected from a retrospective search and an ongoing periodic search. Based on the known quantity of references of interest in the backfile and its most recent updates, one can look at citation charges, estimated connect time per citation to arrive at a ballpark estimate of the search cost for a retrospective search and an ongoing periodic search to update the database.

#### REFERENCE MANAGER

Reference Manager is a easy-to-use personal bibliographic database software available in IBM and Macintosh versions. References are typed in by hand or imported from certain databases using a companion CAPTURE software. The latest release of Capture recognizes a wide variety of biological and biomedical databases but covers only Chemical Abstracts in the physical and applied sciences. INSPEC and COMPENDEX, the major databases of interest to engineers, are not programed for import into a Reference Manager database. Contact the vendor if you are interested in importing INSPEC and COMPENDEX references; they may be able to suggest something or write a conversion program for you. However, given Reference Manager's biomedical focus, there is a strong possibility that you will have to keyboard in those INSPEC and COMPENDEX references.

To avoid keyboarding, you can try modifying INSPEC and COMPENDEX references to look like references from another database that Reference Manager will import. You may be able to modify references enough so that Reference Manager will import a large amount of the information on its own into your personal database. Since titles and abstracts have the most words, a minimal successful import would get the titles and abstracts into the personal database. It is then a relatively smaller job to keyboard in the rest of the

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reference to make each reference complete. With Reference Manager, you can monitor each reference during import and keyboard in missing bibliographic elements that did not make it, eg page numbers.

You may have to first globally modify your target references to get them into a format that Reference Manager will recognize. First, gather the sample formats for the references that Reference Manager will import and then pick out a likely target format closest to the format of the references you are trying to import (eg INSPEC and COMPENDEX references). Reference Manager's recognized formats are listed on the CAPTURE importing menu; samples of some or all of these formats can be rounded up from the vendor, a librarian, or someone with a password on the Dialog and BRS online databanks.

Reference Manager is available from Research Information Services in two versions depending on the size of the database(s) you wish to create. Reference Manager costs \$195 for one database up to 800 references and additional databases up to 200 references each, or, \$440 for one database up to 32,000 references and additional databases up to 200 references each.

The CAPTURE module for importing references from database searches costs \$59. Another module that outputs references in over 100 preprogrammed common journal formats costs \$39. For IBM users, the \$79 SPLICER module provides cut-and-paste capability between wordprocessing software and the Reference Manager database; this feature is intrinsic to Macintosh usage of Reference Manager. A 35mm slide management module costs another \$39. A separate Grant Accountant software is available to track grant expenditures.

#### PRO-CITE

Pro-Cite is another easy-to-use personal bibliographic database software available in IBM and Macintosh versions. References are typed in by hand or imported as ASCII comma-delimited files; individual databases up to 32,000 references can be built. Different versions of a companion module entitled Biblio-Link are used to import references into a Pro-Cite database from the databases on the Dialog, Dialog Knowledge Index, BRS, BRS AfterDark, and STN online databanks (including INSPEC and COMPENDEX). A Pro-Cite database can also accept references from the COMPENDEX compact disk

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through two Biblio-Link software: SilverPlatterLink and BRS Biblio-Link. Pro-Cite and the appropriate Biblio-Link module are the only guarantee at importing INSPEC and COMPENDEX references into your personal database. EndNote and Reference Manager do not specifically target references from the INSPEC and COMPENDEX databases as Pro-Cite does.

Pro-Cite is available from Personal Bibliographic Software for \$395; it is available in many academic bookstores for \$250. A Biblio-Link module costs \$195 eg the Dialog Biblio-Link.

#### ENDNOTE

EndNote is an easy-to-use Macintosh personal bibliographic database software; no IBM version is available. An EndNote database of up to 32,000 references can be created by typing in the references by hand; references from UNIX's Refer and Pro-Cite database software can be imported into EndNote. References from other online databases can be imported using a companion software entitled EndLink. EndLink imports references from many of the databases available on online databanks. EndNote can open up your personal database while you are wordprocessing; EndNote works with Microsoft Word, MacWrite, WordPerfect, and WriteNow.

The key to ascertaining which databases can be imported into EndNote is understanding how EndLink interprets database records. EndLink looks for specific tags identifying fields in the records being imported. For example, EndLink looks for an author tag "AU" which identifies the information that follows to be the authors of the reference. In addition to tags, EndLink looks for a spatial relationship between the field tags and the information in the fields corresponding to the tags. EndLink looks for field tags at the left margin and for field information to be indented from the field tags. The best approach regarding which databases work and which do not is trial-and-error or calling the vendor. Avi Rappoport at the vendor is the expert on importing references into EndNote with EndLink. You can import references from INSPEC and COMPENDEX but you should call Avi for detailed advice. Every database has a different format for its references and Avi has experimented with many of them. Usually you have to have the references output from the online database in a specific field-tagged format and then maybe do some global search-and-replace steps with wordprocessing software.

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EndNote and EndLink are available from Niles & Associates. EndNote cost \$129 and EndLink costs \$99; both together cost \$199. EndNote and Endlink together cost over \$300 less than the completely outfitted Macintosh versions of Reference Manager and Pro-Cite. EndNote and EndLink offers exceptional value to Macintosh users and is worth a close look. Separate software for managing grants (Mac or IBM) and grant personnel (IBM only) are available.

## NOTEBOOK II

Notebook II is an easy-to-use personal bibliographic database software available for IBMs. References are typed in by hand or imported as ASCII comma-delimited files; a companion module entitled Convert is used to import references into a Notebook database from the databases on Dialog or BRS. A companion Bibliography module scans a manuscript for in-text citations and compiles a bibliography.

Available from Pro/Tem Software, Notebook II costs \$189. The Bibliography module costs 99 and the Convert module costs \$75. All three together cost \$299.

## GET REFERENCES DOWNLOADED WHEN YOU REQUEST A DATABASE SEARCH

If you are paying to have a database search run, you should seriously consider receiving those references downloaded onto disk in addition to receiving a printout. Even if you have no plans at the time to put those references into a bibliographic database, you may wish to do so later. Having the references stored away on disk avoids unnecessary keyboarding down the road.

To import references into your bibliographic database software, you need those references downloaded onto a disk that your microcomputer can read. This is no problem if you are the person doing the search or if the person doing the search for you uses the same microcomputer. However if the person executing the search for you uses a different microcomputer, then the file will have to be converted from IBM-to-Macintosh or Macintosh-to-IBM. This can be accomplished through a number of options including uploading the file of references to an intermediate computer followed by a subsequent download to your microcomputer.

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If you want references from a database search delivered on disk, be sure to ask for it when requesting the search. It may be too late to ask after the search is run.

IBM-to-Mac or Mac-to-IBM file conversion options reviewed in:

DeJean, David. PC-to-Mac survival guide. PC/COMPUTING 2(11):78-87, November 1989.  
Howard, Bill. Crossing format frontiers: low-hassle solutions to data transfer. PC MAGAZINE 8(8):94-97, April 25, 1989.  
Izarek, Stephanie. Reconcilable differences: Mac and PC. PC MAGAZINE 8(8):175-1188, April 25, 1989.  
Rizzo, John. PC to Mac and back. MACUSER 5(10):143-159, October 1989.

#### SOURCE LIST OF PRODUCTS & SERVICES

AD-EX

(translators)  
525 Middlefield Rd Suite 150  
Menlo Park CA 94025  
(415)854-6732

American Geological Institute  
(GeoRef database)  
4220 King St  
Alexandria VA 22302

American Geotran  
(translators)  
PO Box 26539  
Austin TX 78755-0539  
(512)450-1320

American Meteorological Society  
(Meteorological & Geostrophysical Abstracts)  
45 Beacon St  
Boston MA 02108

American Translators International  
(800)443-2344  
(800)443-2444 Calif  
fax (415)323-3233

Associated Technical Services  
(multilingual scientific dictionaries and translations)  
855 Bloomfield Ave

GlenRidge NJ 070280-1394  
(201)748-5673  
fax (201)748-5560

BRS After Dark  
(reduced-rate after-hours online databank)  
see BRS Information Technologies

BRS Information Technologies  
Division of Maxwell Online  
(online databank)  
8000 Westpark Dr  
McLean VA 22102  
(800)289-4277  
fax (703)893-4632

Cambridge Scientific Abstracts  
(Aquatic Sciences & Fisheries Abstracts compact disk, ISMEC)  
7200 Wisconsin Ave  
Bethesda MD 20814  
(800)227-3052

Data-Star (online databank)  
485 Devon Park Dr, Suite 110  
Wayne PA 19087  
800-221-7754  
fax 215-687-0984

Dialog Information Services  
(online databank, Knowledge Index,  
COMPENDEX PLUS compact disk)  
3460 Hillview Ave  
Palo Alto CA 94304  
800-334-2564 except Calif  
800-982-5838 Calif

ELB Translation Services  
1911 Jefferson Davis Hwy, Suite 907  
Arlington VA 22202  
(703)998-5505

Engineering Information  
(Compendex database)  
345 East 47th St  
New York NY 10017  
(800)221-1044

ICOA Translations

1500 walnut St  
Philadelphia PA 19102  
(215)875-4650

IEEE Service Center  
(INSPEC database)  
445 Hoes Lane  
PO Box 1331  
Piscataway NJ 08855-1331  
(201)562-5549  
Fax (201)981-0027

Institute for Scientific Information  
(Current Contents, SCISEARCH,  
Science Citation Index compact disk)  
3501 Market St  
Philadelphia PA 19104  
(215)386-0100

Knowledge Index  
(reduced-rate after-hours online databank)  
see Dialog Information Services

Missouri Library Network Corp (MLNC)  
(compact disk players at discount to education institutions)  
10332 Old Olive Street Road  
St Louis Missouri 63141.  
(800)444-8096  
(314)567-3799  
fax (314)567-3798.

Niles & Associates  
(EndNote bibliographic database software)  
2200 Powell, Suite 765  
Emeryville CA 94608  
(415)655-6666

NTIS (clearinghouse for government-sponsored reports)  
Order with regular delivery: (703)487-4650  
Order with rush delivery: (800)336-4700  
Assistance in identifying report for sale: (703)487-4780  
Fax for receiving orders: (703)321-8547  
Subscription Dept (703)487-4630  
5285 Port Royal Rd  
Springfield VA 22161

Orbit Search Service (online databank)  
8000 Westpark Dr

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McLean VA 22102  
800-456-7248  
fax 703-893-4632

Personal Bibliographic Software  
(Pro-Cite bibliographic database software)  
PO Box 4250  
Ann Arbor MI 48106  
(313)996-1580  
fax (313)996-4672

Polyglot Language Service  
(translators)  
393 7th Ave Suite 201  
San Francisco CA 94118  
(415)387-0290  
fax (415)387-528

Pro/Tem Software  
(Notebook II bibliographic database software)  
814 Tolman Dr  
Stanford CA 94305  
(800)826-2222

Ralph McElroy Translation Company  
PO Box 4828  
Austin TX 78765  
(800)531-9977  
fax (512)472-4591

Research Information Systems  
(Reference Manager bibliographic database software)  
Camino Corporate Center  
2355 Camino Vida Roble  
Carlsbad, CA 92009  
(619)438-5526  
fax (619)438-5573

SilverPlatter Information  
(compact disks)  
37 Walnut St  
Wellesley Hills MA 02181  
(800)343-0064  
fax (617)235-1715

also  
303 Potrero St Suite 29-106  
Santa Cruz CA 95060  
(408)425-7477  
fax (408)425-7522

STN (online databank)  
2540 Olentangy River Rd  
PO Box 3012



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Columbus OH 43210  
800-848-6538  
fax 614-447-3713

Updata  
(compact disk subscriptions and compact disk player vendor)  
1746 Westwood Blvd  
Los Angeles CA 90024  
(213)474-5900

Communications to the tutorial presenter can be addressed to:

USMAIL = UCSD Scripps Inst of Oceanography Library,  
C075C, La Jolla, CA 92093-0175.  
TELEMAIL = [SCRIPPS.LIBRARY/OMNET] MAIL/USA  
ONTYME = CLASS.UCSD/SIOL  
BITNET = PBRUEGGEMAN@UCSD.BITNET  
INTERNET = PBRUEGGEMAN@UCSD.EDU  
DIALMAIL = BRUEGGEMAN  
PHONE = (619)534-1230  
FAX = (619)534-5269  
[]